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December 19, 2003

Nicholas A. Sabatini,
Associate Administrator for Regulation and Certification
Federal Aviation Administration
800 Independence Ave SW
Washington, DC 20591

Dear Nick:

On behalf of the Terminal Area Operations Aviation Rulemaking Committee (TAOARC), and in response to the tasking given to us, please find enclosed the recommended disposition of comments to the RNAV Notice of Proposed Rulemaking Docket No. FAA-2002-FR14002.

The TAOARC also recommends that the effects of these rule changes be disseminated into the appropriate Federal Aviation Administration (FAA) documents, such as operations specifications, FAA Orders providing inspector guidance, and others as needed to assure consistency with the updated rule language. The TAOARC also recommends that guidance for complying with the referenced rules be provided in a timely way.

Thank you for the opportunity to recommend these dispositions.

Sincerely,



Dave Nakamura
Chairman, Terminal Area Operations Aviation
Rulemaking Committee

TAOARC Recommendations for RNAV NPRM Comment Disposition

Overview

The material contained in this document provides a summary of the Terminal Area Operations Aviation Rulemaking Committee (TAOARC) recommended dispositions to the Area Navigation (RNAV) Notice of Proposed Rulemaking (NPRM) comments. For each 14 CFR Part proposed for change in the NPRM, the following information is provided below:

- The text of the rule change proposed in the NPRM (enclosed in <<...>>) and in some cases a brief explanation for the change as proposed in the NPRM
- The recommended disposition of the comments received for that specific change.

Options for the disposition of each comment:

- Accept the NPRM proposed change, possibly with minor changes
- Withdraw the NPRM proposed change
- Withdraw the NPRM proposed change and make a proposal that would be the subject of supplemental rulemaking or,
- Withdraw the NPRM proposed change and assign the topic to a working group (such as TAOARC or AWO HWG) for further action.

The Appendix contains comments received on the NPRM.

Overview	1
14 CFR Part 1.....	2
Sec. 1.1 General definitions	2
Sec. 1.2 Abbreviations and Symbols.....	7
14 CFR Part 71.....	8
14 CFR Part 91.....	8
Sec. 91.129.....	8
Sec. 91.131 Operations in Class B airspace.	8
Sec. 91.175 Takeoff and landing under IFR.....	8
Sec. 91.177 Minimum altitudes for IFR operations.	10
Sec. 91.189 [Amended].....	10
Sec. 91.205 Powered civil aircraft with standard category U.S. airworthiness certificates: Instrument and equipment requirements.....	10
Sec. 91.219(b)(5).....	11
14 CFR Part 97.....	11
Part 97.1 (b):.....	11
Part 97.3 Symbols and Terms used in Procedures.....	11
Part 97.10	12
Part 97.20	12
14 CFR Part 121.....	12
Sec. 121.99 Communications facilities.	12
Sec. 121.103 En route navigation systems.	13
Sec. 121.121 En route navigation systems.	13
Sec. 121.344 [Amended].....	14
Sec. 121.347 Communication and navigation equipment for operations under VFR over routes navigated by pilotage.....	14
Sec. 121.349 Communication and navigation equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over the top.....	14
Sec. 121.351 Communication and navigation equipment for extended over-water operations and for certain other operations.	16
Sec. 121.419 [Amended].....	17
Sec. 121.579 [Amended].....	17
Sec. 121.651 Takeoff and landing weather minimums: IFR: All certificate holders.	18

Sec. 121.652 [Amended]	19
Appendix M to Part 121 [Amended]	19
14 CFR Part 125	19
Sec. 125.203 Communication and navigation equipment.	19
Sec. 125.379 [Amended]	21
Sec. 125.381 Takeoff and landing weather minimums: IFR.	21
14 CFR Part 129	21
Sec. 129.17 Aircraft communication and navigation equipment for operations under IFR or over the top.....	21
14 CFR 135	22
Sec. 135.161 Communication and navigation equipment for aircraft operations under VFR over routes navigated by pilotage.....	22
Sec. 135.165 Communication and navigation equipment: Extended over-water or IFR operations.	23
Sec. 135.225 IFR: Takeoff, approach and landing minimums.	24
Sec. 135.345 [Amended]	25
Appendix F to Part 135 [Amended]	25
Appendix.....	26

14 CFR Part 1

Sec. 1.1 General definitions

The FAA proposes the following definitions or terms as additions to, or amendments of § 1.1:

Air Traffic Service (ATS) route: The FAA is proposing to adopt the term “Air Traffic Service (ATS) route” to describe the U.S. route structure. The term ATS route would include jet routes, area navigation (RNAV) routes, and arrival and departure routes. An ATS route would be defined by route specifications. These route specifications may include an ATS route designator, the path to or from fixes, distance between fixes, reporting requirements, and the lowest safe altitude determined by the appropriate authority.

<< *Air Traffic Service (ATS) route* is a specified route designated for channeling the flow of traffic as necessary for the provision of air traffic services. The term “ATS route” refers to a variety of airways, including jet routes, area navigation (RNAV) routes, and arrival and departure routes. An ATS route is defined by route specifications, which may include:

- (1) An ATS route designator;
- (2) The path to or from significant points;
- (3) Distance between significant points;
- (4) Reporting requirements; and
- (5) The lowest safe altitude determined by the appropriate authority. >>

Recommended Disposition and Explanation: Accept NPRM change. The definition is already in the 14 CFR Ch.1-Part 1, as published in Docket No. FAA-2003-14698. TAOARC does not recommend supplementary rulemaking.

Approach procedure with vertical guidance (APV): This new term would mean an instrument approach procedure based on lateral path and glide path. These approach procedures are flown to a decision altitude (DA). Although these procedures include glide path information, they may not meet the requirements currently established for precision approach and landing operations. This includes the vertical navigation performance and airport infrastructure requirements (i.e., ICAO Annex 14 and FAA Advisory Circular (AC) 150/5300-16). Safety for these procedures is maintained by increasing the required obstacle clearance height or required visibility. An example of an APV approach is the LNAV/VNAV (lateral navigation/vertical navigation) approach minima currently published on RNAV approach plates.

<< *Approach procedure with vertical guidance (APV)* is an instrument approach procedure based on lateral path and vertical glide path. These procedures may not conform to requirements for precision approaches. >>

Recommended Disposition and Explanation: Withdraw NPRM proposed change. US should make categorization and/or classification of approaches a priority for TAO/PARC to pass through AWOHWG to ICAO as soon as possible. Determination of a clear and enabling approach categorization concept is a key requirement for the evolution of a performance-based NAS. The recent commitments by the aviation industry to the implementation of performance-based operations are significant reasons to be quite sure that definitions and terms are enabling rather than possibly constraining. JSC should recommend that FAA file Notification of Difference with ICAO regarding APV and others approach related outstanding differences. US should recommend and support ICAO's proposed further study of approach categorization issues and possible removal of APV from ICAO annexes.

Area navigation low route and Area navigation high route: These terms would be removed and replaced with the term "area navigation (RNAV) route." See discussion of "area navigation (RNAV) route" below.

<< Removed and Replaced with RNAV route as stated below. >> TAOARC does not recommend supplementary rulemaking.

Area navigation (RNAV): The definition of "area navigation (RNAV)" would be broadened by removing the words "station-referenced navigation signals," which refer to ground-based signals, and adding the words "flight path" to cover operations in both the lateral and vertical planes (*i.e.* lateral navigation (LNAV) and vertical navigation (VNAV)).

<< *Area navigation (RNAV)* is a method of navigation that permits aircraft operations on any desired flight path. >>

Recommended Disposition and Explanation This definition is already in the 14 CFR Ch.1-Part 1. TAOARC did not recommend supplementary rulemaking.

Area navigation (RNAV) route: The new term "area navigation (RNAV) route" would refer to those ATS routes established for aircraft capable of using area navigation equipment suitable for those routes.

<< *Area navigation (RNAV) route* is an ATS route based on RNAV that can be used by suitably equipped aircraft. >>

Recommended Disposition and Explanation: This definition already included in CFR14 Ch.1-Part 1. TAOARC did not recommend supplementary rulemaking.

Category I (CAT I) operation: The term "Category I operation" commonly has been used in the aviation industry and in the preambles of FAA regulatory documents for years, but it has never been defined in the CFR. The FAA is therefore proposing to add a definition of this term. The proposed definition of "Category I (CAT I) operation" is "a precision approach with a decision altitude that is not lower than 200 feet (60 meters) above the threshold and with either a visibility of not less than one half statute mile (800 meters) or a runway visual range (RVR) of not less than 1,800 feet (550 meters)."

<< *Category I (CAT I) operation* is a precision instrument approach and landing with a decision altitude that is not lower than 200 feet (60 meters) above the threshold and with either a visibility of not less than 1/2 statute mile (800 meters), or a runway visual range of not less than 1,800 feet (550 meters). >>

Recommended Disposition and Explanation: The TAOARC recommends withdrawal. See APV discussion above for recommended TAO/POARC action. Discussions of definitions for "Category (I) operation,

precision, decision altitude, decision height and a concept for evolved categories of approach procedures are required to support the evolution of a performance-based NAS.

Category II (CAT II) operation, Category III (CAT III) operation, Category IIIa (CAT IIIa) operation, Category IIIb (CAT IIIb) operation, and Category IIIc (CAT IIIc) operation: These definitions would be revised to incorporate the concept of precision RNAV. In each of these definitions, the terms “ILS approach” or “ILS instrument approach” would be replaced with the terms “precision approach” and “precision instrument approach,” respectively. The definitions would also be updated to be compatible with the Joint Aviation Authorities (JAA) terminology.

<< *Category II (CAT II) operation* is a precision instrument approach and landing with a decision height lower than 200 feet (60 meters), but not lower than 100 feet (30 meters), and with a runway visual range of not less than 1,200 feet (350 meters).

Category III (CAT III) operation is a precision instrument approach and landing with a decision height lower than 100 feet (30 meters) or no DH, and with a runway visual range less than 1,200 feet (350 meters).

Category IIIa (CAT IIIa) operation is a precision instrument approach and landing with a decision height lower than 100 feet (30 meters), or no decision height, and with a runway visual range of not less than 700 feet (200 meters).

Category IIIb (CAT IIIb) operation is a precision instrument approach and landing with a decision height lower than 50 feet (15 meters), or no decision height, and with a runway visual range of less than 700 feet (200 meters), but not less than 150 feet (50 meters).

Category IIIc (CAT IIIc) operation is a precision instrument approach and landing with no decision height and with a runway visual range less than 150 feet (50 meters). >>

Recommended Disposition and Explanation The TAOARC recommends withdrawal. See APV and Cat I recommendation above with reasons for action. A thorough study of definitions for “Category (I) operation, precision, decision altitude, decision height and a concept for an evolved categorization of approach procedures are going to be required to support the evolution of a performance-based NAS. It is recognized that all of the Cat II/III definitions will need to be included in the study.

Decision altitude (DA): The FAA proposes to add the definition for “decision altitude (DA)” to describe the mean sea level altitude at which the decision to continue the approach below the authorized minima or make a missed approach is made. This term would be consistent with ICAO terminology.

<< *Decision altitude (DA)* is a specified altitude at (by) which a person (pilot) must initiate a missed approach if the person (pilot) does not see the required visual reference. Decision altitude is expressed in feet above mean sea level. >>

Recommended Disposition and Explanation TAOARC recommends withdrawal. The addition of this definition at this time may create charting, training, and performance-based systems implementation problems in the near term. A study of definitions for “Category (I) operation, precision, decision altitude, decision height and a concept for an evolved categorization of approach procedures are all going to be required to support the evolution of a performance-based NAS. It was also noted that use of “person” in place of “pilot” in this definition is inappropriate.

Decision height (DH): The definition of “decision height” would be revised to specify that it applies only to Category II and III approaches rather than Category I approaches, which would refer to decision altitude. References to “decision height” and “DH” are being replaced with references to “decision altitude” and “DA”, respectively, where minimums are based upon barometric altitude, which is expressed in feet above mean sea level (MSL). In contrast, where minimums are based upon height above ground level (AGL), the term decision height (DH) is used. These changes are being proposed to make the FAA’s regulations consistent with ICAO terminology and to more accurately describe when (the point by which) the decision to continue the approach below the authorized minima or make a missed approach is (must be) made.

<< *Decision height (DH)* is a specified height above the ground level at (by) which a person (pilot) must initiate a missed approach during a Category II or III approach if the person (pilot) does not see the required visual reference. >>

Recommended Disposition and Explanation The JSC Task group recommends withdrawal. The addition of this definition at this time may create charting, training, and performance-based systems implementation problems in the near term. A study of definitions for “Category (I) operation, precision, decision altitude, decision height and a concept for an evolved categorization of approach procedures are all going to be required to support the evolution of a performance-based NAS. It was also noted that use of “person” in place of “pilot” in this definition is inappropriate.

Final approach fix (FAF): This term would be added to indicate that a final approach fix is associated with a nonprecision approach.

<< *Final approach fix (FAF)* defines the beginning of the nonprecision final approach segment and the point where final segment descent may begin. >>

Recommended Disposition and Explanation JSC task group recommends withdrawal. Discussions of definitions for “Category (I) operation, precision, decision altitude, decision height and a concept for an evolved classification of approach procedures are required to support the evolution of a performance-based NAS. The action team also noted the need to determine appropriate definitions and proper usage for the terms glide slope, glide path, electronic glide slope, vertical glide path, vertical profile, vertical path, and other similar forms.

Instrument approach procedure (IAP): This term would be added. It is a general term that applies to all types of approach procedures.

<< *Instrument approach procedure (IAP)* is a predetermined ground track and vertical profile that provides prescribed measures of obstruction clearance and assurance of navigation signal reception capability. An IAP enables a person to maneuver a properly equipped aircraft with reference to approved flight instruments from a specified position and altitude to— (1) A position and altitude from which a landing can be completed; or (2) A position and altitude at which holding or en route flight may begin. >>

Recommended Disposition and Explanation The TAOARC recommends replacing this NPRM definition with the current ICAO definition as follows:

ICAO Definition: INSTRUMENT APPROACH PROCEDURE - A series of predetermined maneuvers by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

Minimum descent altitude (MDA): The definition of “minimum descent altitude” would be revised to change the words “final approach” to “nonprecision final approach,” and to remove the references to “standard instrument approach procedure” and “electronic glide slope.” This change would clarify the definition, as an MDA is applicable to a SIAP without electronic glide slope.

<< *Minimum descent altitude (MDA)* is the lowest altitude to which a person may descend on a nonprecision final approach, or during a circle-to-land maneuver, until the visual reference requirements of § 91.175(c) of this chapter are met. Minimum descent altitude is expressed in feet above mean sea level. >>

Recommended Disposition and Explanation: The TAOARC recommends withdrawal. The current definition would be kept until the categorization issues can be resolved.

Night: The FAA is proposing to revise the definition of the term “night” to reflect that local night may differ from the times published in the American Air Almanac. This concept of local night could limit operations at a particular location when the FAA determines it to be necessary for the safety of operations, for example, when terrain causes sunset significantly earlier than the Almanac indicates.

<< *Night* is the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time or such other period between sunset and sunrise, as may be prescribed by the FAA. >>

Recommended Disposition and Explanation The TAOARC recommends withdrawal. The team understands the NTSB’s recommendation to create rulemaking that might preclude situations similar to the Aspen accident. The team does not consider the proposed change to be an appropriate solution to a very complex and often site specific problem. The team recommends that the FAA explore alternate methods that might address local determination of hours of darkness, appropriate assignment or limiting conditions for approach procedures and how to impose those limitations.

Nonprecision approach procedure (NPA): The FAA is proposing to revise the definition of this term so that there would be no reference to “electronic glide slope.” The term would apply to navigation systems that provide lateral (but not vertical) path deviation guidance.

<< *Nonprecision approach procedure (NPA)* is an instrument approach procedure based on a lateral path and no vertical glide path. >>

Recommended Disposition and Explanation: The TAOARC recommends withdrawal. US should make categorization and/or classification of approaches a priority for TAO/POARC to pass through AWOHWG to ICAO asap... Determination of a clear and enabling approach categorization concept is a key requirement for the evolution of a performance-based NAS. The recent commitments by the aviation industry to the implementation of performance-based operations are significant reasons to be quite sure that definitions and terms are enabling rather than possibly constraining. JSC should recommend that FAA file Notification of Difference with ICAO regarding APV and others approach related outstanding differences. US should recommend and support ICAO’s proposed further study of approach categorization issues and possible removal of APV from ICAO annexes.

Precision approach procedure (PA): The FAA is proposing to revise the definition so that there would be no references to “standard instrument approach procedure” and “electronic glide slope.” The revised term, however, would still be based on lateral course and track information with vertical glide path information. Currently, ILS, microwave landing systems (MLS), Global Navigation Satellite System (GNSS) landing systems (GLS) and precision approach radar (PAR) are recognized precision approach systems.

<< *Precision approach procedure (PA)* is an instrument approach procedure based on a lateral path and a vertical glide path. >>

Recommended Disposition and Explanation TAOARC recommends withdrawal. US should make categorization and/or classification of approaches a priority for TAO/POARC to pass through AWOHWG to ICAO asap... Determination of a clear and enabling approach categorization concept is a key requirement for the evolution of a performance-based NAS. The recent commitments by the aviation industry to the implementation of performance-based operations are significant reasons to be quite sure that definitions and terms are enabling rather than possibly constraining. JSC should recommend that FAA file Notification of Difference with ICAO regarding APV and others approach related outstanding differences. US should recommend and support ICAO’s proposed further study of approach categorization issues and possible removal of APV from ICAO annexes.

Precision final approach fix (PFAF): This term would be added to indicate that a precision final approach fix is associated with a precision or APV approach procedure.

<< *Precision final approach fix (PFAF)* defines the beginning of the precision or APV final approach segment, and denotes the location where the glide path intersects the intermediate segment altitude; *i.e.*, where final segment descent on glide path may begin. >>

Recommended Disposition and Explanation JSC task group recommends withdrawal. US should make categorization and/or classification of approaches a priority for TAO/POARC to pass through AWOHWG to ICAO asap... Determination of a clear and enabling approach categorization concept is a key requirement for the evolution of a performance-based NAS. The recent commitments by the aviation industry to the implementation of performance-based operations are significant reasons to be quite sure that definitions and terms are enabling rather than possibly constraining. JSC should recommend that FAA file Notification of Difference with ICAO regarding APV and others approach related outstanding differences. US should recommend and support ICAO's proposed further study of approach categorization issues and possible removal of APV from ICAO annexes.

RNAV waypoint: The FAA proposes to remove the definition of "RNAV way point (W/P)" because it is overly restrictive.

<< **Has been REMOVED by previous rulemaking**>>.

TAOARC does not recommend supplementary rulemaking.

Route segment: The definition of "route segment" would be revised to mean a portion of a route bounded on each end by a fix or NAVAID. The proposed change would facilitate the development of RNAV routes.

<< *Route segment* is a portion of a route bounded on each end by a fix or navigation aid (NAVAID). >>

Recommended Disposition and Explanation This definition already included in CFR14 Ch.1-Part 1. TAOARC does not recommend supplementary rulemaking.

Sec. 1.2 Abbreviations and Symbols

The FAA proposes to add the following acronyms to the list of abbreviations and symbols in § 1.2:

APV means approach procedure with vertical guidance.

Recommended Disposition and Explanation TAOARC recommends withdrawal. Disposition as above for categorization.

NM means nautical mile.

Recommended Disposition and Explanation TAOARC recommends accept.

NPA means nonprecision approach.

Recommended Disposition and Explanation TAOARC recommends withdrawal. Disposition as above for categorization.

PA means precision approach.

Recommended Disposition and Explanation TAOARC recommends withdrawal. Disposition as above for categorization.

RNAV means area navigation.

Recommended Disposition and Explanation TAOARC recommends accept.

14 CFR Part 71

Docket No. FAA-2003-14698 published this rule as final. Except for the modification to 71.11 as recommended below in the disposition to 97.20, no further action is recommended.

14 CFR Part 91

Sec. 91.129

Recommended Disposition and Explanation: Withdraw changes to definitions (and corresponding abbreviations – APV, NPA, PA, PFAF) of precision and nonprecision approaches, Cat I, Cat II, Cat III, APV, and related terms to allow for detailed discussion/harmonization.

Use of “glide” within the text of 91.129 will be considered in the definition changes.

Withdraw change except for change to section 91.129(e) (2), rewritten as follows: “A large or turbine-powered airplane approaching to land on a runway served by an instrument landing system (ILS), if the airplane is ILS equipped, shall fly that airplane at an altitude at or above the glide slope between the outer marker (or point of interception of glide slope, if compliance with the applicable distance from clouds criteria requires interception closer in) and the point at which (if necessary) a missed approach must be initiated; and”

This removed the reference to middle marker.

Sec. 91.131 Operations in Class B airspace.

The FAA is proposing to revise the rule as follows:

<< (c) * * *

(1) For IFR operation. An operable and suitable RNAV system, or VOR or TACAN receiver; and

* * * * *

17. Amend Sec. 91.175 by amending paragraphs (e) introductory text and (j) by removing the word “pilot” and adding in its place the word “person,” by revising paragraphs (a), (b), (c) introductory text, (e)(1)(ii), (f) introductory text, (h), and (k) to read as follows:>>

Recommended Disposition and Explanation: Withdraw changes to definitions (and corresponding abbreviations – APV, NPA, PA, PFAF) of precision and nonprecision approaches, Cat I, Cat II, Cat III, APV, and related terms to allow for detailed discussion/harmonization.

Withdraw change from “pilot” to “person.” Retain as “pilot.”

In a cover letter that provides recommendations, note that the industry requests the FAA to provide timely guidance on systems that can be used to meet this rule.

Sec. 91.175 Takeoff and landing under IFR.

The FAA is proposing to revise the rule as follows:

<<(a) Instrument approaches to civil airports. Unless otherwise authorized by the FAA, when it is necessary to use an instrument approach to a civil airport, each person operating an aircraft must use a standard instrument approach procedure prescribed in part 97 of this chapter for that airport. This paragraph does not apply to United States military aircraft.

(b) Authorized DA/DH or MDA. For the purpose of this section, when an approach procedure requires the use of DA/DH or MDA, the authorized DA/DH or MDA is the highest of the following--

(1) The DA/DH or MDA prescribed by the approach procedure.

(2) The DA/DH or MDA prescribed for the pilot in command.

(3) The DA/DH or MDA for which the aircraft is equipped.

(c) Operation below DA/DH or MDA. Where a DA/DH or MDA is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, at any airport below the authorized MDA or continue an approach below the authorized DA/DH unless--

* * * * *

(e) * * *

(1) * * *

(ii) Upon arrival at the missed approach point, including a DA/DH where a DA/DH is specified and its use is required, and at any time after that until touchdown.>>

Recommended Disposition and Explanation: Withdraw changes to definitions (and corresponding abbreviations – APV, NPA, PA, PFAF) of precision and nonprecision approaches, Cat I, Cat II, Cat III, APV, and related terms to allow for detailed discussion/harmonization.

<< (f) Civil airport takeoff minimums. Unless otherwise authorized by the FAA, no person operating an aircraft under part 121, 125, 129, or 135 of this chapter may takeoff from a civil airport under IFR unless weather conditions are at or above the weather minimums for IFR takeoff prescribed for that airport under part 97 of this chapter. Where published civil takeoff minimums are based on a specified route, persons operating that aircraft must comply with that route unless an alternative route has been assigned by ATC. If takeoff minimums are not prescribed under part 97 of this chapter for a particular airport, the following minimums apply to takeoffs under IFR for aircraft operating under part 121, 125, 129, or 135 of this chapter:>>

Recommended Disposition and Explanation: Withdraw the entire NPRM change to paragraph (f) based on the need to clarify the relationship with air carrier 121.189 departure flight track operations approval. In addition, there was no explanation provided for adding the phrase “unless an alternative route has been assigned by ATC.”

(h) Comparable values of RVR and ground visibility. Except for Category II or Category III minimums, if RVR minimums for takeoff or landing are prescribed in an instrument approach procedure, but RVR is not reported for the runway of intended operation, the RVR minimum must be converted to ground visibility in accordance with the Comparable Values of RVR and Ground Visibility table in FAA Order 8260.3, “United States Standard for Terminal Instrument Procedures (TERPS)” (incorporated by reference in Sec. 97.20 of this chapter). This visibility is the minimum for takeoff or landing on that runway.>>

Recommended Disposition and Explanation: Accept change as shown in the NPRM. It is determined that TERPS is regulatory by reference and as such will affect content in the other publications such as AIM and Flight Information Publications.

<< (k) ILS components. The basic components of an ILS are the localizer, glide slope, and outer marker, and, when installed for use with Category II or Category III instrument approach procedures, an inner marker. The following means may be used to substitute for the outer marker: compass locator; precision approach radar (PAR) or airport surveillance radar (ASR); DME, VOR, or nondirectional beacon fixes authorized in the standard instrument approach procedure; and a suitable RNAV system in conjunction with a fix identified in the standard instrument approach procedure. Applicability of, and substitution for, the inner marker for a Category II or III approach is determined by the appropriate 14 CFR Part 97 approach procedure, letter of authorization, or operations specification pertinent to the operation.>>

Recommended Disposition and Explanation: Accept the proposed revision as shown in the NPRM with a minor change, as follows;

“fixes authorized in the standard instrument approach procedure or a suitable RNAV system in conjunction”

In addition: Add new paragraph (l) with the following proposed text as supplemental rule making:

(l) The administrator may approve use of systems and procedures meeting requirements other than those specified if;

- 1) The systems and procedures proposed are shown to have equivalent or better performance than other FAA approved systems, are operationally safe, effective, and reliable for approach, landing, missed approach, or a takeoff as applicable; and,

- 2) If visual reference requirements apply, the pilot is able to determine that flight visibility is adequate for safe takeoff or landing.

Sec. 91.177 Minimum altitudes for IFR operations.

The FAA is proposing to revise the rule as follows:

<< (a) Operation of aircraft at minimum altitudes. Except when necessary for takeoff or landing, no person may operate an aircraft under IFR below--

(1) The applicable minimum altitudes prescribed in parts 95 and 97 of this chapter. However, if both a MEA and a MOCA are prescribed for a particular route or route segment, a person may operate an aircraft below the MEA down to, but not below, the MOCA, provided the applicable navigation signals are available. For aircraft using VOR for navigation, this applies only when the aircraft is within 22 nautical miles of that VOR (based on the reasonable estimate by the pilot operating the aircraft of that distance); or

(2) If no applicable minimum altitude is prescribed in parts 95 and 97 of this chapter, then--

(i) In the case of operations over an area designated as a mountainous area in part 95 of this chapter, an altitude of 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

(ii) In any other case, an altitude of 1,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown.>>

Recommended Disposition and Explanation: Accept NPRM proposal for 91.177 as written (except replace person with pilot and add the phrase in italics "(a) ... Except when necessary for takeoff or landing, *or when otherwise authorized by the administrator,*").

In response to a comment received, delete the last sentence of the preamble and add a sentence "This is not intended to be a requirement for surveillance."

Sec. 91.189 [Amended]

The FAA is proposing to revise the rule as follows:

<<23. Amend Sec. 91.189 (c) by removing the term "DH" and adding in its place the term "DA/DH" wherever it appears, and amend paragraph (d) by removing: the word "pilot" and inserting the word "person."

>>

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization. Retain the term "pilot." Change "person" to "pilot" in (f).

Sec. 91.205 Powered civil aircraft with standard category U.S. airworthiness certificates: Instrument and equipment requirements.

The FAA is proposing to revise the rule as follows:

<< (d) * * *

(2) Two-way communication and navigation equipment suitable for the route to be flown.

* * * * *

(e) Flight at and above 18,000 feet MSL (FL 180). If VOR navigation equipment is required under paragraph (d)(2) of this section, no person may operate a U.S.-registered civil aircraft within the 50 states and the District of Columbia at or above FL 180 unless that aircraft is equipped with approved DME or a suitable RNAV system. When the DME or RNAV system required by this paragraph fails at and above FL 180, the pilot in command of the aircraft must notify ATC immediately, and then may continue operations at and above FL 180 to the next airport of intended landing where repairs or replacement of the equipment can be made.>>

Recommended Disposition and Explanation: Accept NPRM proposal except retain the altitude above which DME is required – that is, keep it at the value currently described in the regulation. A sufficient justification was not provided and comments identified additional costs that would be imposed as a result.

Sec. 91.219(b)(5)

The FAA is proposing to revise the rule as follows:

Amend Sec. 91.219(b)(5) by removing the term “DH” and adding in its place the term “DA/DH.”

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

14 CFR Part 97

Part 97.1 (b):

FAA is proposing the following rule revision:

<< (b) Departure procedures. This part also prescribes departure procedures (DPs) developed for aircraft operating under parts 121, 125, 129, and 135 of this chapter to avoid obstacles, and establishes weather minimums that apply for takeoff under IFR at civil airports. Where published civil takeoff weather minimums are based on a specified route, persons operating that aircraft must comply with that route unless an alternative route has been assigned by ATC.

Recommended Disposition and Explanation: Withdraw, pending resolution of 91.175. Editor's comment: NPRM text has significant ramifications for 121.189, which could invalidate air carrier takeoff analysis. Must be consistent with 91.175. The question has been raised as to whether or not the proposed NPRM language even belongs in Part 97.

Part 97.3 Symbols and Terms used in Procedures

"Helipoint":

Recommended Disposition and Explanation: Publish: with minor word change of term to “heliport reference point” in accordance with AC150/5390-2B.

MSA "Minimum Safe Altitude":

Recommended Disposition and Explanation: Accept the definition.

Height Above Touchdown (HAT): Height Above Touchdown is the US/FAA form of HAT. The description or definition of “HAT” (height above touchdown), which currently appears in Part 97 paragraph (i), would be revised to read, “height above threshold expressed in feet.” This would be a nomenclature change to make the FAA’s regulations consistent with ICAO and the JAA/FAA harmonized definition of HAT is currently Height Above Threshold and is not considered operationally significant. Changes to approach charts and affected FAA documents will be made during regular review process.

<< HAT “Height Above Touchdown” will be amended to Height Above Threshold. >>

Recommended Disposition and Explanation: Accept the NPRM change.

"Visibility Minimum"

Recommended Disposition and Explanation: Withdraw, and retain existing definition.

Part 97.10

Recommended Disposition and Explanation: Withdraw the change to 97.10, and retain existing version with minor wording change to remove reference to Form 3139

Note: Even though the references to FAA Form 3139 are obsolete, this section provides the opportunity to implement future procedures such as internationally harmonized criteria. Suggested revised wording to this section should consider "...on forms acceptable to the FAA" rather than specifying Form numbers.

Part 97.20

Recommended Disposition and Explanation: Implement supplemental rulemaking to remove the incorporation of these two Orders by reference, to support flexibility in updating the criteria. And while this flexibility is important, so is the opportunity for the public to comment and review dispositions of comments. It is therefore recommended that any modification to these Orders be made available for public review in the Federal Register, and comments and their disposition to be provided to the Docket system.

In addition, Part 71 must be updated to be consistent with the supplemental rulemaking for 97.20, since Part 71.11 refers to Part 97.20 and the Orders currently incorporated by reference.

14 CFR Part 121

Sec. 121.99 Communications facilities.

FAA is proposing the following rule revision:

<< (a) Each certificate holder conducting domestic or flag operations must show that a two-way communication system, or other means of communication approved by the FAA, is available over the entire route under normal operating conditions. The communications may be direct links or via an approved communication link that will provide reliable and rapid communications under normal operating conditions between each airplane and the appropriate dispatch office, and between each airplane and the appropriate air traffic control unit, except as specified in Sec. 121.351(c). For non-normal and emergency operation conditions, the communication system for use between each airplane and the appropriate dispatch office and between each airplane and the appropriate ATC unit must have two-way voice communication capability. For the purpose of communications between the airplane and the dispatch office under this section, the term "rapid communications" means that the caller must be able to establish communications with the called party in less than four minutes.>>

Recommended Disposition and Explanation: Accept the NPRM proposal for removal of the word "radio" in "two-way radio communication."

Accept the NPRM addition of the phrase "other means of communication approved by the FAA" except change the FAA to "the Administrator."

Modify the requirement for "rapid communication under normal operating conditions" to be defined as "the communication system must have been demonstrated to be capable of establishing communications with the called party in approximately ten minutes, unless otherwise authorized by the Administrator."

Withdraw NPRM requirement to have voice communication with dispatch in non-normal and emergency situations.

121.99 (a) would then read:

- (a) Unless otherwise authorized by the administrator, each certificate holder conducting domestic or flag operations must show that a two-way communication system, or other means of communication, each approved by the Administrator, is suitable and available over the entire route under normal operating conditions as follows:
 - (1) The communications may be direct links or via an appropriate communication link through a communication service provider that will provide reliable and rapid communications under normal operating conditions between each airplane and the

- appropriate dispatch office, if applicable, and between each airplane and the appropriate air traffic service unit.
- (2) For communications with ATS units and dispatch offices during the conduct of extended overwater and certain remote area operations, the term "rapid communications under normal operating conditions" means that the communication system must have been shown to be capable of establishing communications with the called party within approximately ten minutes, unless otherwise authorized by the Administrator, and
 - (3) Notwithstanding the requirements in subparagraphs (a)(1) and (a)(2), at least one of the communication systems for use between each airplane and the appropriate ATS unit has two-way voice communication capability.

The TAOARC recommends adding words from the relevant legal interpretation to the preamble and guidance material about this definition of rapid communications is not intended to be an absolute. Also the preamble should clearly state that this is not intended to change or impose any additional requirement for either a dispatch function, or for COM function or capability beyond that currently required for FAR 121 operators.

Sec. 121.103 En route navigation systems.

FAA is proposing the following rule revision:

<< (a) Except as provided in paragraph (b) of this section, each certificate holder conducting domestic or flag operations must show, for each proposed route (including to any regular, provisional, refueling or alternate airports), that suitable navigation aids are available over the route to navigate the airplane along the route with the required accuracy. Navigation aids required for approval of routes outside of controlled airspace are listed in the certificate holder's operations specifications except for those aids required for routes to alternate airports.

(b) Navigation aids are not required for any of the following operations--

- (1) Day VFR operations that the certificate holder shows can be conducted safely by pilotage because of the characteristics of the terrain;
- (2) Night VFR operations on routes that the certificate holder shows have reliably lighted landmarks adequate for safe operation; and
- (3) Other operations approved by the FAA.>>

Recommended Disposition and Explanation: Accept the NPRM proposed changes except remove the word "System" from the title. Make the wording identical to 121.121. Add explanatory text to the preamble to clarify that navigations are not restricted to ground-based navigation aids as per handbook.

Sec. 121.121 En route navigation systems.

FAA is proposing the following rule revision:

<< (a) Except as provided in paragraph (b) of this section, no certificate holder conducting supplemental operations may conduct any operation over a route (including to any destination, refueling or alternate airports) unless suitable navigation aids are available over the route to navigate the airplane along the route with the required accuracy. Navigation aids required for routes outside of controlled airspace are listed in the certificate holder's operations specifications except for those aids required for routes to alternate airports.

(b) Navigation aids are not required for any of the following operations--

- (1) Day VFR operations that the certificate holder shows can be conducted safely by pilotage because of the characteristics of the terrain;
- (2) Night VFR operations on routes that the certificate holder shows have reliably lighted landmarks adequate for safe operation; and
- (3) Other operations approved by the FAA.>>

Recommended Disposition and Explanation: Accept the NPRM proposed changes except remove the word "System" from the title. Make the wording identical to 121.103. Add explanatory text to the preamble to clarify that navigations are not restricted to ground-based navigation aids as per handbook.

Sec. 121.344 [Amended]

FAA is proposing the following rule revision:

<<41. Amend Sec. 121.344 by removing the words "decision height" and adding in their place the words "decision altitude/decision height" in paragraph (a)(54).>>

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

Sec. 121.347 Communication and navigation equipment for operations under VFR over routes navigated by pilotage.

FAA is proposing the following rule revision:

<< (a) No person may operate an airplane under VFR over routes that can be navigated by pilotage unless the airplane is equipped with the communication equipment necessary under normal operating conditions to fulfill the following:

- (1) Communicate with at least one appropriate station from any point on the route; and
- (2) Communicate with appropriate air traffic control facilities from any point within Class B, Class C, or Class D airspace, or within a Class E airspace surface area designated for an airport in which flights are intended.

* * * * *

(b) No person may operate an airplane at night under VFR over routes that can be navigated by pilotage unless that airplane is equipped with>>

Recommended Disposition and Explanation: Accept the proposed change except replace "person" with "pilot."

Sec. 121.349 Communication and navigation equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over the top.

FAA is proposing the following rule revision:

<< (a) Navigation equipment requirements. Except as provided in paragraph (c) of this section, no person may conduct operations under VFR over routes that cannot be navigated by pilotage, or operations conducted under IFR or over the top, unless the airplane used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system need be provided for precision approach and APV operations. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Communication equipment requirements. No person may operate an airplane under VFR over routes that cannot be navigated by pilotage, and no person may operate an airplane under IFR or over the top, unless the airplane is equipped with--

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a); and

(2) Except as required in Sec. 121.99, for non-normal and emergency operating conditions, at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a), and has two-way voice communication capability.

(c) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the airplane may be equipped with a single independent navigation system suitable for the route to be flown if:

(1) The airplane is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The airplane has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(d) Use of VOR navigation equipment. If VOR navigation equipment is used to comply with paragraph (a) or (c) of this section, no person may operate an airplane unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.

(e) Additional communication system equipment requirements. In addition to the requirements in paragraph (b) of this section, no person may operate an airplane having a passenger seat configuration of 10 to 30 seats, excluding each crewmember seat, and a maximum payload capacity of 7,500 pounds or less, under IFR, over the top, or in extended over-water operations unless it is equipped with at least--

(1) Two microphones; and

(2) Two headsets, or one headset and one speaker.>>

Recommended Disposition and Explanation: Accept with the following modifications to the rule language (changes highlighted) and to the preamble:

(a) Navigation equipment requirements. Except as provided in paragraph (c) of this section, no person may conduct operations under VFR over routes that cannot be navigated by pilotage, or operations conducted under IFR or over the top, unless the airplane used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. [REDACTED]

[REDACTED]. However, only one marker beacon receiver providing visual and aural signals and one ILS receiver need be provided. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Communication equipment requirements. No person may operate an airplane under VFR over routes that cannot be navigated by pilotage, and no person may operate an airplane under IFR or over the top, unless the airplane is equipped with--

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a); and

(2) Except as required in Sec. 121.99, [REDACTED] at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a), and has two-way voice communication capability.

(c) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the airplane may be equipped with a single independent navigation system suitable for the route to be flown if:

(1) The airplane is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for [REDACTED] safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The airplane has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(d) Use of VOR navigation equipment. If VOR navigation equipment is used to comply with paragraph (a) or (c) of this section, no person may operate an airplane unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.

(e) Additional communication system equipment requirements. In addition to the requirements in paragraph (b) of this section, no person may operate an airplane having a passenger seat configuration of 10 to 30 seats, excluding each crewmember seat, and a maximum payload capacity of 7,500 pounds or less, under IFR, over the top, or in extended over-water operations unless it is equipped with at least--

- (1) Two microphones; and
- (2) Two headsets, or one headset and one speaker.

Change preamble to include the following:

The FAA is proposing to revise Section 121.349 to recodify and clarify existing requirements. The proposed paragraph (a) would replace the requirement for two independent receivers with a requirement for two independent navigation systems. The intent is to be enabling for new types of navigation systems such as highly capable INS and this is not intended to require two FMSs. A VOR and an FMS would satisfy the requirement. The two independent navigation systems must be suitable for the route to be flown, so that they both support compliance with the requirements proposed in Sec. 121.103(a) or Sec. 121.121(a). There would be no requirement for the two systems to be identical, so that a single VOR and a single suitable RNAV system would satisfy this requirement on a Victor airway. Systems are considered independent if there is no probable failure or event that could affect both systems. The intent of this rule is to ensure that there is no single point of failure or event affecting aircraft navigation systems that causes loss of the ability to navigate along the intended route or to proceed safely to a suitable diversion airport.

The change is also intended to address the characteristics of GPS, which uses very weak signals that could be susceptible to interference. At the present time, the threat of interference to GPS is not considered to be probable and GPS systems can be considered, for the purposes of this rule, as independent navigation systems. However, unforeseen future events might make interference more likely for some GPS systems. If this should occur, then actions might be needed to assure that it is improbable that an aircraft would lose the ability to proceed along the intended route or to proceed to a suitable diversion airport. Under this scenario, operations of aircraft that are not equipped for this contingency may be severely limited. Presently the FAA sees a need for a full DME infrastructure and a minimal VOR network to remain for the foreseeable future. However, as the NAS evolves and navigation technology improves, a satellite-based system may become the core of the aviation navigation infrastructure.

Sec. 121.351 Communication and navigation equipment for extended over-water operations and for certain other operations.

FAA is proposing the following rule revision:

<< (a) Except as provided in paragraph (c) of this section, no person may conduct an extended over-water operation unless the airplane is equipped with at least two independent communication systems that meet the following requirements--

- (1) The communication equipment necessary under normal operating conditions to communicate with at least one appropriate station from any point on the route;
- (2) The communication equipment necessary under normal operating conditions to receive meteorological information from any point on the route by either of two independent communication systems. One of the communication systems used to comply with this paragraph may be used to comply with paragraphs (a)(1) and (a)(3) of this section;
- (3) For non-normal and emergency operating conditions, one communication system having two way voice communication capability; and
- (4) Two LRNSs when VOR or ADF radio navigation equipment is unusable along a portion of the route.

* * * * *

(c) * * *

- (1) The ability of the flightcrew to navigate the airplane along the route with the required accuracy,

* * * * *

- (3) The duration of the very high frequency communications gap, if only very high frequency communication equipment is installed. >>>

Recommended Disposition and Explanation: Accept the NPRM change and add to the preamble an explanation to clarify that the intent of this change is to be enabling and accommodate existing exemptions. If an aircraft has the systems mentioned in the Boeing comment (SATCOM, broadband, or other specialized communication system gaps, as well as VHF), they are already covered.

Sec. 121.419 [Amended]

FAA is proposing the following rule revision:

Amend Section 121.419(a)(1)(vii) by removing the term ``DH" and adding in its place the term ``DA/DH".

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

Sec. 121.579 [Amended]

FAA is proposing the following rule revision:

Amend Sec. 121.579(b) introductory text by removing the words ``decision height" and adding in their place the term ``DA/DH" and amend paragraphs (b)(1) and (b)(2) by removing the term ``ILS" and adding in its place the word ``precision".

Amend Sec. 121.651 by replacing the term ``DH" with the term ``DA/DH" wherever it appears in paragraph (c) and by revising paragraph (d) introductory text to read as follows:

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

In addition, propose supplemental rulemaking to modify 121.579 as follows (as recommended by the Flight Guidance Systems Harmonization Working Group):

“§ 121.579 Minimum heights for use of autopilot.

Unless otherwise approved by the administrator, an autopilot may not be used lower than the applicable heights specified below. Enroute altitudes or heights are considered to be above terrain as applicable to the route flown. For takeoff, approach, or landing, the heights are above the runway touchdown zone elevation, runway elevation, or airport elevation, as applicable.

(a) Takeoff and initial climb.

An autopilot may not be used for takeoff or initial climb below the following height:

- (1) Below the value specified in the approved AFM for takeoff, or
- (2) If a minimum engagement height is not specified by the AFM, an autopilot may not be used below 500' above the departure airport elevation.

Notwithstanding (1) or (2) above, the Administrator may determine that an autopilot engagement height lower than 500 feet above airport elevation, or an engagement height different than that specified by the AFM may be used by issuing operations specifications authorizing an alternate minimum engagement height.

(b) Enroute.

- (1) For autopilots certificated in accordance with AC 25.1329 (dated), as amended, the autopilot may not be used during cruise at a height less than twice the demonstrated height loss, or 500 feet above applicable terrain, which ever is higher. For autopilots that do not specify a height loss or specify a negligible height loss, the autopilot may not be used during cruise at a height less than 500 feet above applicable terrain.
- (2) For autopilots not certificated in accordance with paragraph (1) above, the autopilot may not be used during cruise at a height less than twice the demonstrated height loss, or 500 feet above applicable terrain, which ever is higher. For autopilots that do not specify a height loss, the autopilot may not be used during cruise at a height less than 750 feet above applicable terrain.

(c) Approach.

Except in accordance with section (d) below, no person may use an autopilot during approach at a height that is less than the following, as applicable:

- (1) The minimum height specified in the AFM for autopilot approach for the mode(s) used, or
- (2) Not lower than a height equal to twice the maximum height loss specified in the Airplane Flight Manual for a malfunction of the autopilot under applicable approach conditions, or less than 50 feet above the landing runway touchdown zone, whichever is higher, or
- (3) For systems that are demonstrated to have negligible or zero height loss (below the intended descent flight path) for applicable failure conditions, the autopilot may not be used below 50 feet above the landing runway touchdown zone, runway elevation or airport elevation; or
- (4) For systems where a minimum use height, or height loss for approach is not specified in the AFM, an autopilot may not be used at any altitude less than 50 feet below the lowest applicable DA(H) or MDA(H) for the instrument procedure being used, except as follows:
 - (i) If the pilot determines that suitable visual reference, as specified in § 91.175 of this chapter, has been established during an instrument approach, and can reasonably be expected to be maintained, or
 - (ii) If weather conditions do not require use of an approved instrument approach procedure, an autopilot may be used for approach no lower than the greatest of the applicable minimum use height specified in the AFM, or twice the applicable height loss, or 50 feet above the landing runway touchdown zone elevation, runway elevation, or airport elevation, as applicable, or
 - (iii) If an approved and appropriately functioning autoland capability is used in accordance with section (d) below, or
 - (iv) If the Administrator issues operations specifications authorizing use of a lower autopilot minimum use height, but not less than 50 feet above the landing runway touchdown zone elevation, runway elevation, or airport elevation, as applicable. Issuance of operations specifications based on this provision requires that the certificate holding office determine that a lower minimum use height can be safely used by that operator, for that operators type(s) of aircraft, authorized airport(s), underlying approach terrain, instrument procedures used, applicable DA(H) or MDA(H), and flight crew procedures, or
 - (v) If executing an autopilot coupled go-around or missed approach, using an appropriately certificated and functioning autopilot with go-around capability.

(d) Landing.

Notwithstanding paragraph (c) of this section, autopilot minimum use height provisions do not apply to autopilot operations when an approved automatic landing system mode is used. Automatic landing systems may not be used except in accordance with approved operations specifications.

(e) Go-Around.

Following a go-around, unless an automatic go-around is accomplished, an autopilot may not be engaged below the minimum height specified in section (a) above for takeoff or initial climb. For an automatic go-around initiated with an autopilot already engaged, an autopilot minimum use height does not apply. Use of automatic go-around capability must not adversely affect safe obstacle clearance. “

Sec. 121.651 Takeoff and landing weather minimums: IFR: All certificate holders.

FAA is proposing the following rule revision:

<<*****

- (d) A pilot may begin the final approach segment of a Category I precision approach procedure at an airport when the visibility is less than the visibility minimums prescribed for that procedure if that airport is

served by an operative PAR and another operative precision instrument approach system, and both the PAR and the precision approach are used by the pilot. However, no person may continue an approach below the authorized DA, unless>>

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

Sec. 121.652 [Amended]

FAA is proposing the following rule revision:

<<Amend Section 121.652(a) by removing the term ``DH" wherever it appears and adding in its place the term ``DA/DH".>>

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

Appendix M to Part 121 [Amended]

FAA is proposing the following rule revision: <<Amend Appendix M by removing the words ``Selected decision height" and adding in their place the words ``Selected decision altitude/decision height" in Parameter number 54.>>

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization.

14 CFR Part 125

Sec. 125.203 Communication and navigation equipment.

FAA is proposing the following rule revision:

<< (a) No person may operate an airplane unless it has two-way communication equipment able, at least in flight, to transmit to, and receive from, appropriate facilities 22 nautical miles away.

(b) No person may operate an airplane over the top unless it has navigation equipment suitable for the route to be flown.

(c) No person may operate an airplane carrying passengers under IFR or in extended over-water operations unless the airplane has at least the following equipment:

(1) Two transmitters;

(2) Two microphones;

(3) Two headsets or one headset and one speaker;

(4) Two independent communication systems, one of which must have two-way voice communication capability, capable of transmitting to, and receiving from, at least one appropriate facility from any place on the route to be flown; and

(5) Two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system need be provided for precision approach and APV operations. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(d) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (c) of this section, the airplane may be equipped with a single independent navigation system suitable for the route to be flown if--

(1) The airplane is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The airplane has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(e) Use of VOR navigation equipment. If VOR navigation equipment is required by paragraph (c) or (d) of this section, no person may operate an airplane unless it is equipped with at least one approved DME or a suitable IFR approved RNAV system.

(f) Notwithstanding the requirements of paragraph (c) of this section, installation and use of a single LRNS and a single LRCS for extended over-water operations in certain geographic areas may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization:

- (1) The ability of the flight crew to navigate the airplane along the route with the required accuracy;
- (2) The length of the route being flown with a single navigation or communication system; and
- (3) The duration of the very high frequency communications gap, if only very high frequency communication equipment is installed.

57. Amend Sec. 125.321 by revising the heading to read as set forth below and by removing the words "ground or navigational facility" and adding in their place the words "ground facility or navigation aid".>>

Recommended Disposition and Explanation: Withdraw the use of APV etc. pending update of definitions and approach categorization. In addition, make the following revisions:

(a) No person may operate an airplane unless it has two-way communication equipment able, at least in flight, to transmit to, and receive from, appropriate facilities 22 nautical miles away.

(b) No person may operate an airplane over the top unless it has navigation equipment suitable for the route to be flown.

(c) No person may operate an airplane carrying passengers under IFR or in extended over-water operations unless the airplane has at least the following equipment:

- (1) Two transmitters;
- (2) Two microphones;
- (3) Two headsets or one headset and one speaker;
- (4) Two independent communication systems, one of which must have two-way voice communication capability, capable of transmitting to, and receiving from, at least one appropriate facility from any place on the route to be flown; and
- (5) Two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications.

Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(d) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (c) of this section, the airplane may be equipped with a single independent navigation system suitable for the route to be flown if--

- (1) The airplane is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for [REDACTED] safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The airplane has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(e) Use of VOR navigation equipment. If VOR navigation equipment is required by paragraph (c) or (d) of this section, no person may operate an airplane unless it is equipped with at least one approved DME or a suitable IFR approved RNAV system.

(f) Notwithstanding the requirements of paragraph (c) of this section, installation and use of a single LRNS and a single LRCS for extended over-water operations in certain geographic areas may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization:

- (1) The ability of the flight crew to navigate the airplane along the route with the required accuracy;
- (2) The length of the route being flown with a single navigation or communication system; and
- (3) The duration of the very high frequency communications gap, if only very high frequency communication equipment is installed.

57. Amend Sec. 125.321 by revising the heading to read as set forth below and by removing the words "ground or navigational facility" and adding in their place the words "ground facility or navigation aid"

Sec. 125.379 [Amended]

FAA is proposing the following rule revision: Amend Sec. 125.379(a) by removing the term "DH" wherever it appears and adding in its place the term "DA/DH".

FAA is proposing the following rule revision: Amend Sec. 125.381 (a) and (b) by removing the word "pilot" and adding in its place the word "person", and by revising paragraph (c) to read as follows:

Recommended Disposition and Explanation: Withdraw the change pending update of definitions and approach categorization and do not replace "pilot" with "person."

Sec. 125.381 Takeoff and landing weather minimums: IFR.

FAA is proposing the following rule revision:

<< (c) If a pilot initiates an instrument approach procedure based on a weather report that indicates that the specified visibility minimums exist and subsequently receives another weather report that indicates that conditions have worsened to below the minimum requirements, then the pilot may continue with the approach and landing only if both of the following conditions are met-

- (1) The later weather report is received when the airplane is in one of the following landing phases:
 - (i) The airplane is on a precision approach or APV and has passed the precision final approach fix.
 - (ii) The airplane is on the final approach segment using a nonprecision approach procedure.
 - (iii) The airplane is on a PAR final approach and has been turned over to the final approach controller.
- (2) The pilot in command finds, on reaching the authorized MAP or DA/DH, that the actual weather conditions are at or above the minimums prescribed in the certificate holder's operations specifications.>>

Recommended Disposition and Explanation: Withdraw the changes pending update of definitions and approach categorization.

14 CFR Part 129

Sec. 129.17 Aircraft communication and navigation equipment for operations under IFR or over the top.

FAA is proposing the following rule revision: << (a) Aircraft navigation equipment requirements. No person may conduct operations under IFR or over the top unless the aircraft used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system needs to be provided for precision approach and APV operations. However, only one marker beacon receiver providing visual and aural signals and one ILS receiver need be provided. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Aircraft communication equipment requirements. No person may operate an aircraft under IFR or over the top, unless it is equipped with--

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a) of this chapter; and

(2) For non-normal and emergency operating conditions, at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a) of this chapter must have two-way voice communication capability.

(c) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the aircraft may be equipped with a single independent navigation system suitable for the route to be flown if--

(1) The aircraft is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach.

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The aircraft has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(d) VOR navigation equipment. If VOR navigation equipment is required by paragraph (a) or (c) of this section, no person may operate an aircraft unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.>>

Recommended Disposition and Explanation: Accept the changes except for the revisions described below to make it compatible with the disposition to 121.349, for the same reasons.

(a) Aircraft navigation equipment requirements. No person [REDACTED] may conduct operations under IFR or over the top unless the aircraft used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications.

[REDACTED] Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Aircraft communication equipment requirements. No person may operate an aircraft under IFR or over the top, unless it is equipped with--

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a) of this chapter; and

(2) [REDACTED] at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a) of this chapter must have two-way voice communication capability.

(c) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the aircraft may be equipped with a single independent navigation system suitable for the route to be flown if--

(1) The aircraft is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for [REDACTED] safely to a suitable airport and completing an instrument approach.

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The aircraft has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(d) VOR navigation equipment. If VOR navigation equipment is required by paragraph (a) or (c) of this section, no person may operate an aircraft unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.

14 CFR 135

Sec. 135.161 Communication and navigation equipment for aircraft operations under VFR over routes navigated by pilotage.

FAA is proposing the following rule revision:

<< (a) No person may operate an aircraft under VFR over routes that can be navigated by pilotage unless the aircraft is equipped with the communication equipment necessary under normal operating conditions to fulfill the following:

(1) Communicate with at least one appropriate station from any point on the route.

(2) Communicate with appropriate air traffic control facilities from any point within Class B, Class C, or Class D airspace, or within a Class E airspace surface area designated for an airport in which flights are intended.

(3) Receive meteorological information from any point en route.

(b) No person may operate an aircraft at night under VFR over routes that can be navigated by pilotage unless that aircraft is equipped with--

(1) Communication equipment necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section; and

(2) Navigation equipment suitable for the route to be flown.>>

Recommended Disposition and Explanation: Accept but replace “person” with “pilot.”

Sec. 135.165 Communication and navigation equipment: Extended over-water or IFR operations.

FAA is proposing the following rule revision:

<< (a) Aircraft navigation equipment requirements. No person may conduct operations under IFR or extended over-water unless the aircraft used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. However, only one navigation system need be provided for precision approach and APV operations. Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.

(b) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the aircraft may be equipped with a single independent navigation system suitable for the route to be flown if:

(1) The aircraft is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for navigating safely to a suitable airport and completing an instrument approach;

(2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and

(3) The aircraft has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.

(c) VOR navigation equipment. Whenever VOR navigation equipment is required by paragraph (a) or (b) of this section, no person may operate an aircraft unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.

(d) Aircraft communication equipment requirements. Except as permitted in paragraph (e) of this section, no person may operate a turbojet airplane having a passenger seat configuration, excluding any pilot seat, of 10 seats or more, or a multiengine airplane in a commuter operation, as defined in part 119 of this chapter, under IFR or in extended over-water operations unless it is equipped with—

(1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a) of this chapter; and

(2) For non-normal and emergency operating conditions, at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a) of this chapter must have two-way voice communication capability.

(e) IFR or extended over-water communications equipment requirements. A person may operate an aircraft other than that specified in paragraph (d) of this section under IFR or in extended over-water operations if it meets all of the requirements of this section, with the exception that only one communication system transmitter is required for operations other than extended over-water operations.

(f) Additional aircraft communication equipment requirements. In addition to the requirements in paragraphs (d) and (e) of this section, no person may operate an aircraft under IFR or in extended over-water operations unless it is equipped with at least:

(1) Two microphones; and

(2) Two headsets or one headset and one speaker.

(g) Extended over-water exceptions. Notwithstanding the requirements of paragraphs (a), (b), (d) and (e) of this section, installation and use of a single LRNS and a single LRCS for extended over-water operations in certain geographic areas may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization:

(1) The ability of the flight crew to navigate the airplane along the route with the required accuracy,

(2) The length of the route being flown with a single navigation or communication system; and

(3) The duration of the very high frequency communications gap, if very high frequency communications equipment is installed.>>

Recommended Disposition and Explanation: Accept the changes except for the revisions described below to make it compatible with the disposition to 121.349, for the same reasons.

- (a) Aircraft navigation equipment requirements. No person may conduct operations under IFR or extended over-water unless the aircraft used in those operations is equipped with at least two approved independent navigation systems suitable for the route to be flown and authorized in the certificate holder's operations specifications. [REDACTED] Equipment used to receive signals en route also may be used to receive signals on approach, if it is capable of receiving both signals.
- (b) Use of a single independent navigation system. Notwithstanding the requirements in paragraph (a) of this section, the aircraft may be equipped with a single independent navigation system suitable for the route to be flown if:
- (1) The aircraft is equipped with at least one other independent navigation system suitable, in the event of loss of the navigation capability of the single system at any point along the route, for [REDACTED] safely to a suitable airport and completing an instrument approach;
 - (2) Both navigation systems are authorized by the FAA in the certificate holder's operations specifications; and
 - (3) The aircraft has sufficient fuel so that the flight may proceed safely to a suitable airport by use of the remaining navigation system, and complete an instrument approach and land.
- (c) VOR navigation equipment. Whenever VOR navigation equipment is required by paragraph (a) or (b) of this section, no person may operate an aircraft unless it is equipped with at least one approved DME or suitable IFR approved RNAV system.
- (d) Aircraft communication equipment requirements. Except as permitted in paragraph (e) of this section, no person may operate a turbojet airplane having a passenger seat configuration, excluding any pilot seat, of 10 seats or more, or a multiengine airplane in a commuter operation, as defined in part 119 of this chapter, under IFR or in extended over-water operations unless it is equipped with—
- (1) For normal operating conditions, at least two independent communication systems that fulfill the functions specified in Sec. 121.347(a) of this chapter; and
 - (2) [REDACTED] at least one of the two independent communication systems that fulfills the functions specified in Sec. 121.347(a) of this chapter must have two-way voice communication capability.
- (e) IFR or extended over-water communications equipment requirements. A person may operate an aircraft other than that specified in paragraph (d) of this section under IFR or in extended over-water operations if it meets all of the requirements of this section, with the exception that only one communication system transmitter is required for operations other than extended over-water operations.
- (f) Additional aircraft communication equipment requirements. In addition to the requirements in paragraphs (d) and (e) of this section, no person may operate an aircraft under IFR or in extended over-water operations unless it is equipped with at least:
- (1) Two microphones; and
 - (2) Two headsets or one headset and one speaker.
- (g) Extended over-water exceptions. Notwithstanding the requirements of paragraphs (a), (b), (d) and (e) of this section, installation and use of a single LRNS and a single LRCS for extended over-water operations in certain geographic areas may be authorized by the Administrator and approved in the certificate holder's operations specifications. The following are among the operational factors the Administrator may consider in granting an authorization:
- (1) The ability of the flight crew to navigate the airplane along the route with the required accuracy,
 - (2) The length of the route being flown with a single navigation or communication system; and
 - (3) The duration of the very high frequency communications gap, if very high frequency communications equipment is installed.

Sec. 135.225 IFR: Takeoff, approach and landing minimums.

FAA is proposing the following rule revision:

<< (c) * * *

- (1) On a precision or APV approach and has passed the precision final approach fix; or
* * * *
- (3) On a nonprecision final approach; and the aircraft--

* * * * *

(ii) Where a final approach fix is not specified, has completed the procedure turn and is established inbound toward the airport on the final approach course within the distance prescribed in the procedure. The approach may be continued, and a landing made, if the pilot finds, upon reaching the authorized MDA or DA/DH, that actual weather conditions are at or above the minimums prescribed for the procedure.

(d) For each pilot in command of a turbine-powered airplane who has not served at least 100 hours as pilot in command in that type of airplane, the MDA or DA/DH and visibility landing minimums prescribed in part 97 of this chapter or in the certificate holder's operations specifications for a particular approach must be increased by 100 feet and one half statute mile, respectively, but not to exceed the ceiling and visibility minimums for that approach when used as an alternate airport.>>

Recommended Disposition and Explanation: The TAOARC recommends withdrawal of the change using the terms APV, precision, nonprecision, DA/DH, etc. until definitions and terminology issues are resolved as dispositioned in 14 CFR Part 1. In addition, the TAOARC recommends withdrawal of the change from "pilot" to "person."

Sec. 135.345 [Amended]

FAA is proposing the following rule revision:

Amend Sec. 135.345(a)(7) by removing the term "DH" and adding in its place the term "DA/DH".

Recommended Disposition and Explanation: The TAOARC recommends withdrawal of the change until definitions and terminology issues are resolved as dispositioned in 14 CFR Part 1.

Appendix F to Part 135 [Amended]

FAA is proposing the following rule revision: Amend Appendix F by removing the words "Selected decision height" and adding in their place the words "Selected DA/DH" in Parameter number 54.

Recommended Disposition and Explanation: The TAOARC recommends withdrawal of the change until definitions and terminology issues are resolved as dispositioned in 14 CFR Part 1.

Appendix

This Appendix summarizes comments received on the RNAV NPRM. The submitted comments also can be found on the Department of Transportation Docket Management System, associated with Docket No. 14002. For disposition and discussion of the comments, see the main body of this document.

Comments	
General	
1.	We have found the proposed rule to be very complex and involve many issues with ramifications affecting crewmember training and aircraft equipage requirements. (RAA—5)
2.	May impose significant navigation equipment requirements to NAS users—(RAA—5)
3.	The need to corroborate the indicated language within the proposed rule against current operational practices, and expected future program goals, is critical to the further enabling of effective transitions and changes implied or required by the proposed rule. (ATA—7)
4.	There is very little language regarding Required Navigation Performance (RNP), a cornerstone of our future airspace system, endorsed by the FAA Administrator. (Continental—13)
5.	Delta requests additional information to determine if this regulation is intended for all operators in US airspace or only US operators. Delta believes the intent of this rule should also be required by foreign-registered operators operating in the US (NOTAM) - especially if the FAA is trying to make the US skies safer. Specifically, if US operators flying in the Gulf are mandated to install and carry extra equipment, so should others operating within US Gulf airspace. (Delta—18)
6.	I am opposed to the change of any rule, regulation or standard for the purpose of conforming to the ICAO standards. For example, the change to the weather reporting (METAR/TAF) has destroyed this medium for the majority of pilots, who like me, do not speak, nor want to learn french. The US acquiescence to the French pressures in that instance is nothing short of a disaster. Fortunately, there are other sources of weather information available today that has mitigated the impact of this misguided action. To the extent that these proposed changes are not being driven by ICAO standardization, I do not object to them. However, in each and every instance, I urge you to reexamine the proposed change to assure that they are not being made to conform to the ICAO standards. If the ICAO member countries really want uniformity, then they can easily adopt out methods. Keeping in mind that the vast majority of aviation activity occurs in the US, we should not allow ourselves to be whipped around by a minority. Especially when those same countries have screwed their systems up so that the affordable freedom of flight is all but gone, general aviation is dead or dying, bureaucracy, astronomical user fees, privatization of ATC, and oppressive restrictions prevail. That is not my vision of aviation in this country and adherence to the ICAO standards is a major step in that direction. While some ICAO standards are in fact harmless, e.g., the reclassification of airspace, (I really don't mind calling a TCA Class B airspace), we need to... [Sic]—(Brock 21)
7.	While many pilots anticipate utilizing the proposed capabilities, the majority of general aviation aircraft do not currently have the necessary equipment. Instead, they use the existing infrastructure and route system with existing avionics equipment. Those operations must not be adversely impacted at the expense of these proposed changes. (AOPA—23)
8.	<p><i>General Impression: The NPRM contains serious flaws both in its concepts and execution. If enacted in its present form, the rules will have a disastrous affect upon the global harmonization achieved in AC120-28D and AC120-29A, and will corrupt and subvert both the intent and guidance offered by these two Advisory Circulars, as well as Operations Specifications. The NPRM will in effect establish a second, parallel set of regulations and definitions that will be confusing to operators, avionics and equipment manufacturers, and instrument procedure developers. The NPRM is going in the opposite direction of worldwide aviation harmonization.</i></p> <p>AC120-28D and AC120-29A were developed by industry, FAA, and JAA experts through numerous meetings over a period of years, and with the investment of hundreds of thousands of dollars, and thousands of man-hours. These documents were painstakingly crafted and harmonized by the brightest, most knowledgeable minds in aviation. The NPRM is an affront to the efforts expended for harmonization and standardization by the AWOHWG.</p> <p>The NPRM creates serious contradictions with these Advisory Circulars in terminology, definitions, and</p>

	Comments
	<p>philosophy. The definitions and content in the NPRM create a “definitional box” which appears to support a presupposed outcome: namely WAAS and LAAS (the concept of precision RNAV).</p> <p>The NPRM creates and/or defines three basic classes of instrument approaches: Non-Precision Approach (NPA), Approach Procedure with Vertical guidance (APV), and Precision Approach (PA). This contradicts the classifications and intent of AC120-29A. AC120-29A (Section 4.3.7.1.c.5) discontinues the use of the former terminology “precision” and “nonprecision”, explicitly states that these terms can be confusing and ambiguous, and their use is discouraged in favor of the common generic term “instrument approach”.</p> <p>AC120-29A (Sections 4.3.2, 4.3.3, and 4.3.7.1.c.1) establishes three general classifications of instrument approaches:</p> <ul style="list-style-type: none"> • <u>xLS</u> • ILS • MLS • GLS • <u>RNAV</u> • Based on RNP (3D or 2D) • “Other” RNAV (3D or 2D) • Note: <ul style="list-style-type: none"> • 3-D RNAV (suitable for LNAV/VNAV) • 2-D RNAV (suitable for LNAV only) • “other than xLS or RNAV” • Includes traditional or classic procedures such as: <ul style="list-style-type: none"> • VOR or VOR/DME • NDB or NDB/DME • LOC and LOC/BC • ASR • LDA and SDF • These approaches may be flown using (Section 4.3.3.b. and c.): <ul style="list-style-type: none"> • Vertical Navigation Path Guidance (VNAV) • Constant Vertical Descent Rate <p>AC120-29A also approves criteria for approaches to be operated to the minima described as CAT I through CAT IIIc, depending upon the lowest DA (or MDA), and the required visibility.</p> <p><i>The single greatest failing of the NPRM is its divergence from this classification of approaches. The FAA and US aviation industry should not go down this path! The NPRM should be rewritten to conform to the classification of approaches as described in AC120-29A. The NPRM should also be rewritten to adopt the definitions and terminology of AC120-28D and AC120-29A. The terms “APV, nonprecision, and precision approaches” should be scrapped entirely.</i> Another area of great concern involves the intended rewriting of Part 91.175 (f) “Civil airport takeoff minimums”. The indicated language may disallow the Engine Failure Turn Procedures used by air carriers at many of their airports. ((Kim Rackley—24)</p>
9.	<p>American Trans Air does not support new definitions/specification that contradict industry/FAA/JAA agreed language contained in Operations Specifications, Advisory Circular 120-29A, or changes not coordinated with industry/users. (Amer Trans—25)</p>
10.	<p>If this NPRM is adopted as it stands it will be inconsistent with these painstakingly created AC’s that have been developed over a period of several years as harmonized documents between the FAA and JAA in Europe. This NPRM will set the aviation industry back 5 to 10 years and may require years to iron out the inconsistencies.</p> <p>The airline industry, which will be directly affected by the NPRM, cannot afford to spend hundreds of thousands of dollars and hundreds of man hours over the next couple years trying to iron out these problems.</p> <p>FAA 2002 14002 if enacted will provide contradictory guidance information to Airline operators, avionics equipment manufacturers, and flight procedure developers, from the guidance that has been promulgated in the above named Advisory Circulars. The NPRM sets a divergent path from the guidance developed in the AC’s, and calls the entire matter of global harmonization into question. In these desperate economic conditions, airlines cannot afford to make badly needed capital investments in state of the art</p>

	Comments
	<p>avionics systems when none of us can determine which systems and procedures will be the ones to be supported in the end.</p> <p>WE MUST HAVE THE OPPORTUNITY TO HARMONIZE the language of FAA 2002 14002 with the recently adopted Advisory Circulars. This is going to require very careful scrutiny of the NPRM and a determination of which sections of it conflict with specific sections of ACI 20-28D and ACI 20-29A. Sections of the NPRM that conflict have got to be fixed! If the NPRM is adopted as currently written, I expect that Alaska Airlines will pay at least \$30,000 in manpower costs to participate in industry groups that will have to iron out the discrepancies that it will create. (Rackley--Alaska Airlines—28)</p>
11.	<p>This NPRM does not meet with the intent of established rule-making practices by moving RNAV regulatory guidance through the rule-making process outside of the TAOARC (Terminal Area Operations Aviation Rule-Making Committee).</p> <p>From FAA Order 1110.132 (TAOARC Charter): <i>“There is a need to fully utilize the capabilities of modern aircraft, specifically the use of area navigation (including the global positioning system). Evolving technologies and potential equipment upgrades provide increased operational and safety benefits not realized unless a practical means is established to direct and facilitate new criteria and implementation. The international aspects of aviation operations and aircraft production require that terminal area operational procedures and associated equipment be consistent.</i></p> <p><i>“This committee provides a forum for the Federal Aviation Administration (FAA), other government entities, and affected members of the aviation community to discuss issues and to develop resolutions and processes to facilitate the evolution of safe and efficient terminal area operations. This committee supports the international harmonization process.”</i></p> <p>We respectfully request that the issues of this NPRM be sent to the TAOARC for review and discussion as part of the rule-making process. The issues raised within this NPRM merit further discussion and are within the scope of the TAOARC’s charter.</p> <p>In the event that the FAA deems it unnecessary to send this issue through the established RNAV rule-making process, we have submitted our comments below on this NPRM. (RAA-31)</p>
12.	<p>General Discussion, paragraph II.D.4 Approach and Landing Using Instrument Approach Procedures. 1. General question on approaches and vertical guidance information. There are references to vertical glide path information based upon electronic glideslope and GLS as well as PAR. Additionally, there are proposed changes to approach minimums defined as an MDA, which are applicable to an instrument approach procedure without electronic glideslope. Where does barometric VNAV fit into these definitions? With baro-VNAV, approach minimums defined with a DA in lieu of MDA may be used.</p> <p>The question is; what determines “glide path”? Does this include all of the following?</p> <ol style="list-style-type: none"> 1. ILS glideslope 2. Augmented GPS APV 3. Barometric VNAV <p>If baro-VNAV is intended to be included as a glide path, then 91.129 (e)(2) must be affected.</p> <p>Additionally, requirements for recurrent proficiency check include 2 precision approaches, 2 non-precision approaches and if the crew is GPS qualified, a GPS approach may be counted as one of the required non-precision approaches. By including a GPS-based approach with barometric VNAV, is this now a precision approach and must be performed in addition to the other 2 precision approaches? The goal should be to establish within the Practical Test Standard document a priority of what constitutes precision and non-precision approaches along with the number of each procedure to be performed. (RAA—31)</p>
13.	<p><i>In re discussions II.D.1, II.D.4, III.1.1</i> Category I is a positive change in that it will include precision RNAV like Alaska is doing in Juneau and opens the door for a precision DH instead of having to use a nonprecision MDA. (RAA—31)</p>
14.	<p>As GPS-based area navigation moves closer to being the standard in the U.S., the FAA needs to streamline procedures for installation of approved GPS-based navigation systems in aircraft -- to harmonize them with current procedures applicable to the current standard, VOR and ILS. As is now the case with standard VOR and ILS receivers, validation flights, STCs, individual aircraft/radio model approvals should no longer be needed. (Ameriflight—32)</p>
15.	<p>We also recommend that the NPRM clearly state whether there is any change to WAAS or LPV and their role in the NAS as a result of this proposed rulemaking. (Rockwell Collins—33)</p>

	Comments
16.	<p>AOPA is concerned that this NPRM attempts to comply with the International Civil Aviation Organization (ICAO) harmonization objectives without regard to the negative impacts that some of the changes could have on civil aviation in the United States. There are significant differences between the United States and European operating environments that make harmonization less than an ideal model for future changes to the domestic system. The Most important of these differences is the role and impact of general aviation in the United States. On issues of global harmonization, the FAA should ensure that the NAS reflects the diverse capabilities of the United States general aviation community, as demonstrated here in the United States.</p> <p>As an ICAO member nation, the United States has a stake in aviation matters within the international community. However, ICAO harmonization should only occur when there is an operational benefit to the users of the United States National Airspace System (NAS). The FAA must meet the challenge of balancing individual state needs against the overall objective of producing a seamless global traffic management system. (AOPA—34)</p>
17.	<p>AVR-1 signed out AC 120-29A in August of 2002, after many experts worked for years on that document. The All Weather Operations Harmonization Working Group, consisting of internationally recognized experts, drafted this AC. The AC provides a revised set of definitions that provide the flexibility needed for current and future airspace utilization based on current aircraft technology. The FAA now proposes different definitions that really are steps backward. The FAA needs to embrace the definitions of AC 120-29A. It needs to provide leadership for this national airspace system and for the world. (Vaughn—Continental—37)</p>
18.	<p>Air Transport Association recommends that an in-depth study be conducted by the Terminal Area Operations Aviation Rulemaking Committee (“TAOARC”). UPS believes that a study by a government-industry working group is imperative to determining whether the proposed changes to Rule 121.99 are appropriate and whether there may be other amendments that would be more beneficial to the balance of safety and operations within the industry. However, UPS is concerned that under TAOARC’s charter, it is generally limited to airspace issues regarding arrival, departure, and airport ground operations. Rule 121.99 addresses an issue that is germane primarily to en route communications. If TAOARC is the best entity to study and address prospective changes to rule 121.99, UPS asks only that TAOARC ensure that it brings to the table experts and analysis regarding en route communications. (UPS—38)</p>
19.	<p>Required Navigational Performance (RNP) operation: The NPRM should be revised to make specific accommodations for RNP operation in its preamble and throughout the associated rules. As written, the FAA is missing an opportunity in this NPRM to leverage advancements in flight management systems (there have been numerous successful implementations of this valuable development). Specific mention of RNP should be made in several locations (as noted in Enclosure 2). Provisions especially should be made to allow RNP-based route width considerations, instead of specifying a 4nm lateral clearance requirement. (Boeing—43)</p>
20.	<p>Lowering Altitude Above Which DME is Required: The altitude above which DME is required should not be lowered from FL240 to FL180, as proposed in the NPRM [i.e., §91.205(e)]. The reason DME was originally specified above FL240 was to address lead turn radius at high true airspeed, not necessarily to correlate with airspace definition. FL240 should be retained, and RNAV methods should also be permitted in lieu of DME as proposed. (Boeing—43)</p>
21.	<p>Pilot vs. Person: We maintain that it is not necessary to change the word “pilot” to “person” in various locations in the proposed text. Pilots fly aircraft. The present term and definition are perfectly clear and adequate. (Boeing—43)</p>
22.	<p>In general, the intent of these amendments is excellent. Amendments to the Federal Aviation Regulations are sorely needed to accommodate the safety and efficiency benefits that modern technology can provide when combined with new operating and air traffic management concepts. While the vast majority of these amendments are fully appropriate and suitable to achieve the objectives of this rulemaking proposal, several of the proposals require amendment to achieve those objectives without adversely impacting the industry or potentially reducing the safety and efficiency benefits that can be achieved with modern technology. Airbus fully supports changes in navigation and communication requirements which facilitate more efficient use of the modern technology that is incorporated in its aircraft. Airbus also fully supports the safety enhancements recommended by the Commercial Aviation Safety Team (CAST), including those related to enhanced navigation and instrument flight procedures. Airbus also supports the recommendations of the Free Flight Executive Steering Committee and the FAA efforts</p>

	Comments
	to modernize the NAS by transforming it to a performance based system. Airbus sees the recommendations of CAST and the Free Flight Executive Steering Committee as essential guidelines to achieving the optimum safety and efficiency benefits that modern technology and new operating and air traffic management concepts can provide. The provisions of any rulemaking effort needs to be fully compatible with the government and industry consensus that have been developed within these two efforts. (Airbus—44)
23.	The NPRM proposes to make a number of changes to FAR Part 1 by adding or amending definitions related to instrument flight operations. Some of these changes also have a very undesirable “ripple effect” in many of the operating rules. A significant number of the changes do not appear to be related to the implementation of RNAV. There also does not appear to be any safety or operating efficiency reason for these changes. In fact, some of these changes adversely affect concepts and operations that have been used safely and efficiently for many years and remain fully suitable for operations in a performance based RNAV NAS. Due to the high degree of connectivity and many very subtle relationships with other regulations as well as numerous evaluation and approval criteria and commonly accepted safe operating practices, it is not possible to understand the significance of a change to a single definition without examining all of the rules and criteria affecting instrument flight operations as a whole. (Airbus—44)
24.	<p>In summary, the intent of these amendments is excellent. Amendments to the Federal Aviation Regulations are sorely needed to accommodate the safety and efficiency benefits that modern technology can provide when combined with new operating and air traffic management concepts.</p> <p>While the vast majority of these amendments are fully appropriate and suitable to achieve the objectives of this rulemaking proposal, several of the proposals require amendment to achieve those objectives without adversely impacting the industry or potentially reducing the safety and efficiency benefits that can be achieved with modern technology. Those amendments include many of the definitions proposed for Part 1. These amendments also include Sections 91.129, 91.175, 91.189, 97.1, 97.20, 121.99, and 121.349. Plus, many other changes are required in the other operating rules due to a “ripple effect” from the inappropriate definitions in FAR Part 1.</p> <p>Airbus fully supports changes in navigation and communication requirements which facilitate safer and more efficient use of the modern technology that is incorporated in its aircraft. Airbus also fully supports the safety enhancements recommended by the Commercial Aviation Safety Team (CAST), the recommendations of the Free Flight Executive Steering Committee, and FAA efforts to modernize the NAS by transforming it to a performance based system.</p> <p>Airbus is willing to assist the FAA in any way it can to implement a performance based national airspace system that optimizes the safety and efficiency benefits that can be achieved from the introduction of modern technology and new operating and air traffic management concepts. RNAV and RNP are both essential elements of this future NAS, which is why the regulatory requirements must assist and encourage this transformation while maintaining the level of safety everyone currently enjoys. (AIRBUS—44)</p>
	Economic
25.	The events of 9/11/2001 and subsequent economic down-turn in our industry have significantly altered industry fleet sizes. This was not reflected in the latest (April 2002) document. Since your analysis is projecting what the fleet will look like 20 years into the future, we believe it is significant that your future fleet projection be based upon current fleet sizes. RAA will provide current data for the regional fleet (RAA—5)
26.	Delta believes this NPRM is definitely significant, would have significant impact on small entities (as well as large), and would impose an unfunded mandate. This rule would likely mandate SATCOM on international aircraft or high frequency radios. (Delta—18)
27.	This NPRM may require additional navigation systems and communications systems (SATCOM, HF). American Trans Air believes this NPRM would have significant impact on small and large entities that would impose an unfunded mandate. (American Trans Air—25)
28.	In the “Benefits and Costs” section of the NPRM, the FAA fails to address the costs to be borne by the aircraft owners in the event of the new rule. (See NPRM at p. 52-54.) This omission reveals an incomplete understanding of the consequences of the changes being proposed. In the regulatory impact analysis, the FAA states that there is no cost to aircraft operators because they already have voice radios on the planes. This might indicate that ATC has been confused with AOC Further, the omission also completely ignores the fact that there

	Comments
	has to exist an infrastructure on the ground as well as in the air, and in much of the world, there is not a corresponding build out. As such, under the proposed rule, the operational options are limited to either expecting someone to bear the capital expense of installing such equipment, or not flying routes over or near the unserved areas. (UPS—38)
29.	<p>In addition, as indicated in the comments to the initial NPRM and the amendments remaining open for comment, the meaning and application of aspects of the proposal are unclear. It, therefore, is very difficult for the industry to comment on FAA's cost benefit analysis. The industry is particularly concerned about the scope of the proposed amendment to 14 CFR Section 121.99(a) concerning communication systems between an airplane and the appropriate dispatch office, specifically the proposed definition of "rapid communications." After review and clarification of the proposed requirements by the TAOARC, particularly the regulatory and/or safety benefits, we urge the FAA to conduct a robust economic analysis of the proposal and to permit additional analysis by the industry, if necessary. Even if the FAA decides not to refer the proposal to TAOARC, we urge the FAA to reevaluate its analysis in light of the additional comments to the docket. There are many uncertainties and unanswered questions; their resolution will determine the ultimate benefit and impact of the proposal.</p> <p>In addition to these preliminary comments, ATA submits the following comments on specific provisions. All references are to the Federal Register Volume 67 (December 17, 2002), with specific item number and page numbers listed. (ATA—41)</p>
	International
30.	The NPRM states there is no ICAO standards that correspond to the proposed rule. American Trans Air believes certain equipment requirements could place US Operators at an economic disadvantage, and questions if the NPRM applies to foreign operators in US Gulf of Mexico airspace. (Amer Trans—25)b
	Part 1
31.	RNAV, PA, PFAF: These all appear to be charting acronyms and not necessary for this section of the CFR. Part-97 may be more appropriate. Drop the definition of area navigation (RNAV). This requires more industry input and rational. (Amer Trans—25)
32.	The definitions of precision and non-precision approaches, definitions of CAT1/2/3, and lack of harmonization with international authorities need more detailed discussion by industry experts, as there will be far reaching changes in our airspace system when these changes are incorporated. (Fred Abbott/Continental—13)
33.	<p>The changes in definitions and terminology can be expected to have significant impact on training materials and equipment manuals. Equipment design can also be affected. For example, the new definition of DH does not include Cat I approaches. However, there are controls, displays and dedicated annunciators in flight decks that use this term without the new distinction. This will cause consistency problems and potentially confusion for the crews.</p> <p>We recommend the NPRM language clearly address:</p> <ul style="list-style-type: none"> (a) whether it is FAA intent that training manuals, equipment manuals, etc be revised to reflect the new definitions and terminology, (b) whether charts will now be revised to use these terms, (c) whether there will be strict compliance between the new definitions, the type of approach being flown, and all control/display functions, (d) whether new terminology requirements will be applied retroactively in any way, e.g., if existing equipment [without any modification] were to be applied to another certification. (Rockwell—33)
34.	<p>Remove the definitions of Area navigation high route, Area navigation low route, Category II operations, Category III operations, Category IIIa operations, Category IIIb operations, Category IIIc operations, Decision height, Minimum descent altitude, Nonprecision approach procedure, Precision approach procedure, and RNAV waypoint.</p> <p>NPRM Proposal: Replacement of current definitions by new definitions and abbreviations for the referenced terms.</p> <p>Comments: The proposal includes definitions of terms and concepts that have limited future application or are defined differently in other FAA technical guidance. Continued use of these terms will result in confusion and</p>

	Comments
	<p>inconsistencies for operators, and is contrary to FAA’s longstanding commitment to harmonization and simplicity. For example, Advisory Circular 120-29A, Page 2, Paragraph 3.4 Category I, II, and III Terminology provides: “The use of the term “non-precision” has been dropped within this AC to reduce confusion which exists with use of this term with current and future systems and authorizations, particularly with Vertical Navigation (VNAV) and Area Navigation (RNAV), and with other approaches that may incorporate the use of barometric VNAV to provide a stabilized descent path to a runway.”</p> <p>Resolution: Include language in the preamble to the FAR Part 1 DEFINITIONS AND ABBREVIATIONS stating that the terms “nonprecision approach procedure” (NPA), “precision approach” (PA), and “precision final approach fix” (PFAF) have been deleted as these definitions no longer provide clarification nor correct context to future approach implementation strategies. Use of the terms “authorized” or “approved” in relation to approach, departure, or arrival procedures would give the needed regulatory authority, while allowing future developments and inherent flexibilities. Further definitions can be included within an air carrier’s Operations Specifications. Continue to coordinate the development of wording compatible with existing harmonized guidance, specifically, AC 120-28D, and AC 120-29A, to enable the implementation of future approach strategies without creating conflicts (as do the proposed changes). (ATA—41)</p>
35.	<p>Remove the definitions of Area navigation high route, Area navigation low route, Category II operations, Category III operations, Category IIIa operations, Category IIIb operations, Category IIIc operations, Decision height, Minimum descent altitude, Nonprecision approach procedure, Precision approach procedure, and RNAV waypoint.</p> <p>Comments: The proposal definitions are confusing and unnecessary. In accordance with AC120-29A, American Airlines has adopted the terminology “Non-ILS” approach procedure in recognition of the high degree of accuracy of RNP RNAV equipped aircraft, particularly when coupled with vertical navigation (VNAV). Regulators and industry should continue to develop wording compatible with existing harmonized guidance, specifically, AC 120-28D, and AC 120-29A, to enable the implementation of future approach strategies without creating conflicts (as do the proposed changes). (AA—42)</p>
36.	<p>Category I, II, and III Definitions: Definitions for Category I, II, and III should be deleted entirely from the regulations and retained only in guidance materials, such as AC 120-28D, AC 120-29A, the Airman’s Information Manual (AIM) and, as necessary, new or revised ACs related to RNP (such as the upcoming revision to AC 90-45A, “Approval of Area Navigation Systems for use in the U.S. National Airspace System.” If adopted, this NPRM will likely cause significant harm to evolution of low visibility landing programs and airborne systems. Category I is not currently limited to, and should not in the future be limited to, use of only one sensor system or technique, such as ILS. This is to ensure consistent application of harmonized criteria for minima across systems, procedures, and methods.</p> <p>Additionally, the definitions in the NPRM are inconsistent with current standard Operations Specifications usage, and are different from those used in current FAA Advisory Circulars AC 120-28D and AC 120-29A (which contain appropriate and correct definitions). (Boeing—43)</p>
37.	<p><i>Approach Classification Definitions:</i> As an example, the proposed definition of “precision approach procedure” appears to be right and reasonable for both current operations and operations in the future performance based NAS. However, when other proposed definitions are considered, such as “Approach Procedure With Vertical Guidance”, contradictions, conflicts, and confusion occurs. The proposed language for the three relevant definitions is shown below.</p> <p>Precision approach procedures (PA) is an instrument approach procedure based on a lateral path and a vertical glide path.</p> <p>Approach Procedure with vertical guidance (APV) is an instrument approach procedure based on lateral path and vertical glide path. These procedures may not conform to requirements for precision approaches.</p> <p>Nonprecision approach procedure is an instrument approach procedure based on lateral path and no vertical path. These definitions would lead one to conclude that an APV approach is a “non precision” approach procedure even though it otherwise appears to meet the definition of a “precision approach”. But the relationship between the rules is more complex than just a conflict with the definitions. The operational consequences of this distinction are very significant due the connectivity and subtle relationships between the definitions and the operating rules and training requirements. The issue is further confused by the introduction of the term “precision final approach fix” which “is associated with a precision or APV approach procedure”.</p> <p>Even though the piloting tasks for a “precision approach” and an “APV” approach are fundamentally the same (tracking lateral and vertical guidance) and the flight instrument displays are equivalent, the apparent</p>

	Comments
	<p>classification of an APV approach as a “non precision approach” (since that is the only other choice in the definitions) would require each air carrier pilot to perform the very same tasks twice in each training sessions and continue to do so for the rest of the pilots flying career. This is very inefficient use of a valuable training resource and the time could be much better spent on much more relevant issues, such as CFIT or Loss of Control prevention. This also creates a large economic burden of the air carrier without achieving any significant safety or operational benefit.</p> <p>Modern technology has reached the point where the old classification schemes are not truly relevant anymore. Current production large transport airplanes currently provide a lateral and vertical navigation capability that uses a combination of GPS, IRS, and barometric information. Currently this LNAV / VNAV capability is approved for instrument approach operations as low as 250 feet above the touchdown zone. However, many believe that this capability will be eventually demonstrated to be safe for operations below 200 feet. Therefore, it makes no sense to call this a “non precision” approach, especially when the piloting tasks are equivalent to an ILS approach. In fact, CAST has recommended that nonprecision approaches should be eliminated to significantly reduce the potential for CFIT and Approach and Landing accidents.</p> <p>Airbus strongly believes that any instrument approach that provides both lateral and vertical guidance should be classified as a precision approach or just as a Category I approach, which raises another issue with the definitions. The proposed definition is in direct conflict with the definition of a Category I operation that has been used safely and successfully in the air carrier operations specification since the mid 1980’s. The Operations Specifications and the accompanying Air Carrier’s Handbook defines a Category I operation as any instrument approach operation that is not a Category II or Category III operation. In other words, Category I operations include both “precision” and “non precision” approaches. The proposed change would limit Category I operations to “precision approaches” and would exclude “nonprecision” and “APV” approaches. There is no safety or operating efficiency reason for the change. In fact, there is no safety or operating efficiency reason why definitions for the various categories of approaches need to be defined in the regulations. In fact, Category I has never been defined in the FARs and there is more than 40 years of safe operation with it being defined in ACs and Orders. Plus, Category II and Category III operations were safely conducted for decades without a definition in the FARs.</p> <p>Airbus believes that navigation technology is evolving so fast that the old NAS terms “precision approach” and “nonprecision approach” are rapidly losing utility or meaning. Therefore, for the future performance based NAS, Airbus believes that there should only be three ways to classify instrument approach operations, Category I, Category II, and Category III. These classifications should be based solely on operating minima (DA/DH and RVR/VIS).</p> <p>Others have also made the argument that even these three categories are dated, since they arose to support an ILS based infrastructure and have limited meaning in a performance based NAS, which is independent of any particular sensor. These persons have argued that modern technology supports operating minima that is a continuum, where the same basic equipment fit can support a wide range of operating minima, based on the runway and approach lighting provided, the training of the flight crew, the maintenance program for a particular operator, and the software options purchased by the operator.</p> <p>In summary, Airbus opposes the proposal to include the proposed definition of Category I operation in FAR Part 1. Airbus also opposes any definition or other regulatory requirement that would not permit an instrument approach that provided both lateral and vertical path guidance to be used in the same manner as ILS approaches have been traditionally used, including pilot training requirements. It is acknowledged that the operating minima and obstacle clearance requirements may not be equivalent to an ILS operation and that these factors would be based on the characteristic of the system.</p> <p>Airbus strongly opposes any definition or other regulatory requirement that would not permit systems that provide both lateral and vertical path guidance to be used for Category II and Category III operations, if the system met the total system performance requirements that have been traditionally required of ILS based systems used in these operations.</p> <p>The classification system for instrument approaches, in specific, and instrument operations, in general, should not be locked in the past but must be focused on operations in the future performance based NAS and the transition to that state.</p> <p>Airbus recommends the elimination of all reference to “precision” and nonprecision” approaches. Instead of using these terms, all instrument approaches should be referred to as Category I, Category II, or Category III. Airbus also recommends the elimination of all references to APV or LPV approaches, which should be considered in the continuum of Category I approaches. Airbus also recommends that the definitions of Category</p>

	Comments
	II and Category III approaches be removed from Part 1 to eliminate any adverse operational consequences or unnecessary operational restrictions that could be encountered in the future during the introduction on modern technology (such as enhanced vision, LAAS, etc) or the introduction of new operating concepts and capabilities. (Airbus—44)
38.	Approach Procedure with Vertical Guidance (APV): AC120-29A does not support this terminology, but rather uses the term “CAT I”. (Rackley—24)
39.	The terms “Approach procedure with vertical guidance (APV), Nonprecision approach (NPA), and Precision Approach (PA)” are contradictory to AC120-29A and should be removed. (Rackley—24)
40.	<p>Approach procedure with vertical guidance (APV) This definition is not supported by AC120-29A, Appendix 1 “Definitions and Acronyms”. AC120-29A simply uses the term “CAT I”. See AC120-29A Section 3.4.b. “APV...a procedure based on lateral path and <i>glide path</i>. These procedures are flown to a decision altitude. Although these procedures include glide path information, they may not meet the requirements currently established for precision approach and landing operations. This includes the vertical navigation performance and airport infrastructure requirements....<i>Safety for these approaches is maintained by increasing the required obstacle clearance height or required visibility.</i> An example of an APV approach is the LNAV/VNAV approach minima currently published on RNAV approach plates.”</p> <p>Question: what is the definition of “glide path”? It is a critical definition that will include or exclude a number of things.</p> <p>Comment: (These questions and comments point to a good reason to scrap the term APV and use AC120-29A concepts.)</p> <p>1) Any conventional (VOR/NDB/DME) approach flown with a constant rate descent could be considered an APV. So could an RNP 0.15 with coded vertical angle and flown using Baro VNAV. The RNP approach is far more accurate both laterally and vertically.</p> <p>2) Exactly how much is the obstacle clearance height and visibility increased? Need an explicit reference for this so we know what we are getting.</p> <p>3) There are varying degrees of LNAV/VNAV capability. What you have on a Cessna is much different from the complete dual systems on a jet, especially those systems that are RNP capable.</p> <p>4) Does a RNP approach flown in LNAV/VNAV even belong here, or is it in reality a precision approach?</p> <p>5) Specific examples of what is considered an APV approach should be cited:</p> <p>--RNAV (GPS)</p> <p>--VOR/NDB/DME/LOC/LOC BC/LDA/SDF etc. flown with a constant rate descent.</p> <p>--Conventional approach flown in LNAV/VNAV using a coded angle. There are differences in system abilities to fly VNAV – these need to be pointed out. There are high and low end systems.</p> <p>--What about RNP flown in LNAV/VNAV? (Rackley—24)</p>
41.	Remove the definition or term APV. How does this serve the public? There is no difference in training or how the approach is flown. This definition appears only to serve the interest of FAA and avoid airport ancillary requirements heretofore associated with ILS. The language should simply read, “served by an instrument approach providing vertical guidance”. Further classifying approach procedures should not be applied in the rules. If FAA requires added categories for internal processing, changes should be applied to internal documents and orders—not the rules. Otherwise full disclosure as to exactly why we require the new term and how it’s used should be included in the preamble. Simply stating to recognize LNAV/VNAV isn’t an acceptable rationale, as we’ve operated with LNAV/VNAV for several years without the rule. (Amer Trans—25)
42.	<i>Approach Procedure with Vertical Guidance (APV):</i> The definition as currently written potentially leads the pilot to believe that APV approach types have lower minima than today’s non precision approaches when in fact substantial evaluation has determined that in many cases, non precision approaches are still providing the lowest possible ceiling and/or visibility minima. The definition vaguely discusses the fact that these procedures do not produce instrument approach minimums associated with traditional vertically guided approaches such as an Instrument Landing System (ILS). There should be clear, specific acknowledgement that these procedures are not intended to replace ILS approaches but rather are intended to offer pilots a “VNAV option” in lieu of nonprecision approaches without vertical guidance. (AOPA—34)
43.	<p><i>Approach procedure with vertical guidance (APV), Item 2, 77339</i> Current: APV is not currently defined in Part 1.</p> <p>NPRM Proposal: Include APV in Part 1.</p> <p>Comments: Current terminology allows for the incorporation of vertical path into an applicable approach. The inclusion of the term APV only further limits the ability to gain the effective coordination and implementation of</p>

	Comments
	LNAV, VNAV, and future implementation of RNP when applied to vertical path. Resolution: Delete proposed APV definition in the NPRM. (ATA—41)
44.	Approach procedure with vertical guidance (APV), Item 2, 77339 Comments: Existing terminology is adequate for approach operations utilizing vertical path guidance. Creating an additional term for an already recognized capability presents a training and cost burden that's unnecessary. Do not incorporate APV verbiage; continue to evolve AC120-29A terminology as required to support RNP RNAV both laterally and vertically. (AA—42)
45.	<i>Approach Procedure with Vertical Guidance (APV)</i> : The new term "approach procedure with vertical guidance (APV)" and the criteria proposed to be used in conjunction with it are unnecessary and contradictory to existing harmonized guidance material. Further, they are not consistent with other important criteria related to RNAV and RNP that are either currently entering use, or have already been used for aircraft design for key elements of the future air carrier fleet (including RNP and Baro VNAV). The term "APV" and text related to it should be removed from this NPRM. (Boeing—43)
46.	While ADF generally approves of the NPRM, ADF expresses concern that the definition of an Air Traffic Service route included in the definitions section of the NPRM does not concur with other regulatory requirements. The route of flight and flight level a Part 121 aircraft is planned at, and/or actually flies, is the joint responsibility of the Aircraft Dispatcher and Pilot-In-Command, and is based on consideration of a number of safety and operational issues, including but not limited to ATC requirements. (ADF—15)
47.	ATS Route: Aligning terminology with IACO is OK. Question: Do we continue to call these new ATS routes "Jet" or "Victor" airways? Is there a new term to be used for day to day communications? "ATS Route XYZ" is a mouthful. Need an example of what these new ATS routes are to be called. (Rackley—24)
48.	Change the definition of ATS Route: The regulation should simply state ATS Route is a route or procedure approved by the Administrator. Why is it necessary to list examples of routes included under ATS Route? This will only serve to restrict any future naming convention. e.g., like the change to 91.205 (Amer. Trans—25)
49.	<i>Area Navigation (RNAV) route</i> : "...would refer to ATS routes established for aircraft operators capable of using area navigation..."
50.	Question: What are we going to call these in day to day operations? Are they "ATS RNAV Route XXX"? (Rackley—24)
51.	RNAV : Drop the definition of area navigation (RNAV). This needs more industry input. (Vaughn/Continental—19)
52.	The definitions listed include the word or phrase "precision", "precision approaches", precision instrument approaches", "nonprecision", and "Nonprecision approach". As the use of these are not in agreement with current practice, as defined in AC 120-28D and AC120-29A, the terms should simply indicate an instrument procedure and the specific type be determined and defined through other guidance material allowed and applied by the Rule. This will enable the progressive implementation of future abilities and concepts as authorized by the Administrator. <i>Proposed resolution</i> : Develop wording compatible with existing harmonized guidance, specifically, AC 120-28D, and AC 120-29A, to enable the implementation of future approach strategies without becoming in conflict with the Rule. (ATA—20)
53.	The use of the word "glide" in subsequent definitions should be reviewed for clarity. With the advent of additional means to determine the desired and expected path of an aircraft, the word "glide" does not add nor contain a meaning or a purpose. The removal of the word "glide" enables a more useful phrase, vertical path, instead of a specified "glide path" which may be wrongly correlated with a specific approach capability, such as an ILS, which has a "glide slope." <i>Proposed resolution</i> : Remove the word "glide" from definitions and uses within the Rule, unless it is determined that specific reasoned results are required and directed by the application of the word "glide" to the text.
54.	The numerical designations for Category IIIa (CAT IIIa) and Category IIIb (CAT IIIb) of "not less than 700 feet" should be revised to the currently understood and approved values. These are currently applied by air carrier Operations Specifications, as amended and updated by Handbook Bulletins (HBAT). Revising them to be consistent with current applications will remove conflicting information. <i>Proposed resolution</i> : Coordinate with the Operations Specifications Working Group or other industry/FAA groups to determine the current applicable values. This will enable the guidance to be located in one location, instead of adding possible confusion due to having the information in multiple locations. (ATA—20)

	Comments
55.	<u>Category I (CAT I) operation:</u> The proposed definition includes the words “CAT I is a precision approach”. This definition is inconsistent with both AC 120-29A (which includes non-precision in Category I approaches) and Operations Specification group CAT I approaches (e.g., see Operations Specification C053). (Delta—18)
56.	<u>Category I Operation:</u> “The FAA therefore proposing to add a definition of this term. The proposed definition of CAT I operation is “a precision approach with a decision height altitude that is not lower than 200’ (60 meters) above the threshold and with either a visibility of not less than one half statute mile (800 meters) or a RVR of not less than 1800 feet (550 meters).” This definition is not supported by AC120-29A, and is contradictory to the AC which defines a CAT I (US) as “an instrument approach...”. The ICAO definition does specify “a precision approach...” AC120-29A does not specify a precision approach in the US. This is a major problem. (Rackley—24)
57.	<u>Category I (CAT I):</u> “...a <u>precision</u> instrument approach and landing...” <u>Category II:</u> “...a <u>precision</u> instrument approach and landing...” <u>Category III:</u> “...a <u>precision</u> instrument approach and landing...” <u>Category IIIa:</u> “...a <u>precision</u> instrument approach and landing...” <u>Category IIIb:</u> “...a <u>precision</u> instrument approach and landing...” <u>Category IIIc:</u> “...a <u>precision</u> instrument approach and landing...” These definitions are not supported by AC120-29A. (Rackley—24)
58.	<u>Category II Category III Category IIIa Category IIIb Category IIIc:</u> —“These definitions would be revised to incorporate the concept of <i>precision RNAV</i> . In each of these definitions, the terms “ILS approach” or “ILS Instrument approach” would be replaced with the terms “precision approach” and “precision instrument approach...” These definitions are not supported by AC120-29A. The AC simply specifies an “instrument” approach. Comment: Exactly what is a “precision RNAV” approach? Is it WAAS? LAAS? RNP 0.3 or less? (Rackley—24)
59.	<u>Category I (CAT I) operation:</u> The definition creates inconsistencies and will generate pilot confusion when used in conjunction with the new proposed “precision approach” definition. For example, if an ILS has approach minimums with a 300 foot DH and ¾ mile visibility will it be a CAT I operation? If an APV approach has the <i>same</i> minimums (to the same or a different runway) will it then be considered a CAT I operation? AOPA would expect the answer to be YES. This scenario raises additional questions pertaining to the currency requirements stated in 14 CFR Part 61 for instrument proficiency and training. AOPA would expect the FAA to permit pilots to receive training and proficiency credit when using any approaches that end at a DA/DH, including APV approaches. (AOPA—34)
60.	<u>“Category I (CAT I) operation:</u> The term “Category I operation” commonly has been used in the aviation industry and in the preambles of FAA regulatory documents for years, but it has never been defined in the CFR. The FAA is therefore proposing to add a definition of this term. The proposed definition of “Category I (CAT I) operation” is “a precision approach with a decision altitude that is not lower than 200 feet (60 meters) above the threshold and with either a visibility of not less than one half statute mile (800 meters) or a runway visual range (RVR) of not less than 1,800 feet (550 meters).” This definition should be changed to read: “Category I (CAT I) operation: The term “Category I operation” commonly has been used in the aviation industry and in the preambles of FAA regulatory documents for years, but it has never been defined in the CFR. The FAA is therefore proposing to add a definition of this term. The proposed definition of “Category I (CAT I) operation” is “a precision approach with a decision altitude that is not lower than 200 feet (60 meters) above the threshold <u>for airplanes, and not lower than 100 feet for helicopters</u> , and with either a visibility of not less than one half statute mile (800 meters) or a runway visual range (RVR) of not less than 1,800 feet (550 meters) <u>for airplanes, and not less than one quarter statute mile or a runway visual range (RVR) of not less than 1,200 feet for helicopters.</u> ” (HAI—40)
61.	<u>Category II (CAT II) operation, Category III (CAT III) operation, Category IIIa (CAT IIIa) operation, Category IIIb (CAT IIIb) operation, and Category IIIc (CAT IIIc) operation:</u> This NPRM should align with JAROPS standards referencing CAT I, CAT II, and CAT III. The need to separate CATIIIa, CATIIIb and CATIIIc should be reviewed with respect to JAROPS, AC120-29, AC120-28D and HBA 99-17. We may be better served to eliminate reference to CAT a, b, c, and consider publishing the lowest minimums to which a fail-operational aircraft may operate and the lowest minimums to which a fail-passive aircraft may operate. (Delta—18)
62.	<u>Category II (CAT II)</u> Comment on Cat II operations and use of decision height (DH) and 1200 RVR. Some airports with irregular terrain, such as Seattle (KSEA) must use a DA rather than DH for minimums. Some exceptions must be made to this definition. For example, the CAT II minimums in KSEA are defined as “Inner Marker Passage” some operators choose to discontinue the approach if the Baro DA is reached prior to inner marker passage in accordance with AC 120-29A 4.3.8.5. The JAA harmonized OpSpecs define Cat II minimum

	Comments
	visibility with suitably equipped runways as 1000 RVR, not 1200 RVR. The 1200 RVR minimum visibility definition needs to be harmonized. (RAA—31)
63.	<i>Category II (CAT II)</i> Cat II harmonization with JAA. - Category II should be defined as a precision instrument approach and landing with a decision height lower than 200 feet (60 meters), but not lower than 100 feet (30 meters) and with a runway visual range of not less than 1,000 feet. (RAA—31)
64.	<i>Category III (CAT III)</i> There are no definitions of CAT IIIa, IIIb, and IIIc required due to international harmonization. - Category III should be defined as a precision instrument approach and landing with a decision height lower than 100 feet (30 meters) or no DH, and with a runway visual range less than 1,000 feet. (RAA—31)
65.	<p>The terms “Category I/II/III operation” has been used in the aviation industry and in the preambles of FAA regulatory documents for years, but it has never been clearly defined in the CFR. Why now is the FAA is therefore proposing to add a definition of these terms? Also, the proposed definitions of Category II/III reflect 1970 capability and thinking. CFR Definitions should not specify the navigation source e.g. ILS, and, if implemented, they should only specify DA/DH in order to allow future enhancements and technology without rule change.</p> <p>Change definitions as follows:</p> <p>Category I operations, with respect to the operation of aircraft, means an approach to the runway of an airport under a instrument approach procedure issued by the Administrator or other appropriate authority with a minimum descent altitude (height) (MDA (H) not lower than 250 feet (75 meters) or a decision altitude (height) (DA (H)) not lower than 200 feet (60 meters).</p> <p>Category II operations, with respect to the operation of aircraft, means an approach to the runway of an airport under a Category II instrument approach procedure with a decision height (DH) lower than 200 feet (60 meters) but not lower than 100 feet (30 meters) issued by the Administrator or other appropriate authority.</p> <p>Category III operations, with respect to the operation of aircraft, means an instrument approach to, and landing on, the runway of an airport using a Category III instrument approach procedure with a decision height (DH) below 100 feet (30 meters) or no decision height (DH) issued by the Administrator or other appropriate authority. (Amer Trans—25)</p>
66.	Category II (CAT II) through Category IIIc (CAT IIIc) The FAA and JAA had previously harmonized the definitions of Category I, II and III approaches. The CAT II and CAT III definitions presented in the NPRM are not consistent with previous harmonization efforts. (RAA--31)
67.	<p><i>Category I/II/III, Item 2, 77339 Resolution:</i> Remove and allow for specific guidance to be provided in the appropriate Advisory Circulars, AC-120-28D, AC 120-29A.</p> <p>Revise the numerical designations for Category IIIa (CAT IIIa) and Category IIIb (CAT IIIb) of “not less than 700 feet” to the currently understood and approved values. These values are applied by air carrier Operations Specifications, as amended and updated by Handbook Bulletins (HBAT). These revisions will ensure consistency and remove conflicting information.</p> <p>Coordination by FAA, and specifically through the TAOARC, with the All Weather Operations (AWO), the Operations Specifications Working Group and other industry/FAA groups to determine the appropriate values. This will enable consistent guidance to be located in the applicable guidance document.</p> <p>Review the use of the word “glide” in subsequent definitions to ensure clarity. With the advent of additional means to determine the desired and expected path of an aircraft, the word “glide” does not add nor contain a meaning or a purpose. The removal of the word “glide” enables a more useful phrase, “vertical path,” instead of a specified “glide path” which may be wrongly correlated with a specific approach capability, such as an ILS, which has a “glide slope.”</p> <p>Further, in discussion on page 77331, Section 91.129 Operations in Class D Airspace, paragraph (2), the indication is that “glide path” includes both ILS and APV. This should be extended to all applicable procedures, including ILS. The term needs to be applicable to additional applications without deterring continued development of procedures.</p> <p>Remove the term “approach” from the title “Instrument approach procedure (IAP)”. The statement in paragraph (2) of the text allows for the application where “...en route flight may begin”, which is not necessarily restricted to being on an “approach”. This could be confusing in developing future airspace enhancement strategies and applications of technology. (ATA—41)</p>
68.	<i>Category I/II/III, Item 2, 77339 Comments:</i> Utilize existing guidance in Advisory Circulars, AC-120-28D and AC 120-29A. If changes are desired they should be coordinated through the TAOARC, with other appropriate

	Comments
	technical groups and committees. (AA—42)
69.	<i>Decision Height (DH)</i> The changes in definitions and terminology can be expected to have significant impact on training materials, equipment manuals, and even equipment design. For example, the new definition of DH does not include Cat I approaches. However, there are controls and displays in flight decks that use this term. This will cause consistency problems and potentially confusion for the crews. (RAA--31)
70.	<p><i>Decision altitude (DA), Item 2, 77339</i> Comments: Use of Decision height (DH) and Decision altitude (DA): The industry has been utilizing the term DA(H) and MDA(H) for a significant period of time, with great success. Reverting back to separate descriptors (DA,DH) is not in the interest of human factors issues nor does it add any value to the procedure. DA(H) and MDA(H) allow for additional flexibility to defining the minimums by use of other functioning equipment. The ICAO definition is included here as a ready reference: DA: A specified altitude in an instrument approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. (Adapted from ICAO - IS&RP Annex 6).</p> <p>Resolution : Use of DA(H) as the term to include both DA and DH. Continue use of HAT as indicated in the current ICAO definition.</p> <ul style="list-style-type: none"> • <i>Reference Decision height (DH), Item 2, 77339</i> Comments: Use of DH and DA: The industry has been utilizing the term DA(H) and MDA(H) for a significant period of time, with great success. Reverting back to these separate descriptors is not in the interest of human factors issues nor does it add any value to the procedure. DA(H) and MDA(H) allow for additional flexibility to defining the minimums by use of other functioning equipment. The ICAO definition is included here as a ready reference: DH: A specified height in an instrument approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established (Adapted from ICAO - IS&RP Annex 6). Additionally, the text from the ICAO manual regarding the use of DA(H) is included: DA(H): For Category I, a specified minimum altitude in an approach by which a missed approach must be initiated if the required visual reference to continue the approach has not been established. The "Altitude" value is typically measured by a barometric altimeter or equivalent (e.g., Inner Marker) and is the determining factor for minima for Category I Instrument Approach Procedures. The "Height" value specified in parenthesis is typically a radio altitude equivalent height above the touchdown zone (HAT) used only for advisory reference and does not necessarily reflect actual height above underlying terrain. For Category II and certain Category III procedures (e.g., when using a Fail-Passive autoflight system) the Decision Height (or an equivalent IM position fix) is the controlling minima, and the altitude value specified is advisory. The altitude value is available for cross reference. Use of a barometrically referenced DA for Category II is not currently authorized for 14 CFR part 121, 129, or 135 operations at U.S. facilities (Adapted from ICAO - IS&RP Annex 6). <p>Resolution: Use of DA(H) as the term to include both DA and DH. Continue use of HAT as indicated in the current ICAO definition. (ATA—41)</p>
71.	<i>Decision altitude (DA), Item 2, 77339</i> Comments: The terms DA(H) and MDA(H) are widely used and understood by the aviation community. Change to these terms does not add anything of value and simply creates confusion for no apparent benefit. (AA—42)
72.	<i>Decision height (DH), Item 2, 77339</i> Comments: The terms DH and DA are widely used and understood by the aviation community. Change to these terms does not add anything of value and simply creates confusion for no apparent benefit. (AA—42)
73.	<i>Decision Height (DH):</i> All references to "decision height" and "DH" should be replaced with "decision altitude (height)" or "DA(H)." Similarly, usage of the term "minimum decision height" would become "minimum decision altitude (height)" or "MDA(H)." Further, the use of "DA/DH" should be dropped, as well as the distinction of its definition with respect to non-precision approaches. This would clearly cover situations where minimums are based upon barometric altitude (decision altitude) in feet above mean sea level (MSL) and where minimums are based upon height above ground level (AGL) or height above the touchdown zone (decision height.) With these changes, the FAA's regulations would then be consistent with ICAO and harmonized terminology, and would more accurately describe when visual reference requirements apply to continue an approach below the authorized minima or make a missed approach. Further, use of the commonly applied terms "DA(H)" and "MDA(H)" in existing operators procedures manuals and training programs would save any unnecessary economic burden of revision of large numbers of existing documents unnecessarily. (Boeing—43)
74.	<i>Definition of Decision Height (DH)</i> Airbus opposes the proposed definition of Decision Height (DH). This definition has at least two significant flaws. First, it prohibits the use of radio altimeters to define the missed approach point in any future Category I approach, even if modern technology could provide a more precise and

	Comments
	therefore safer decision point than having to rely on barometric information and its many limitations, especially in mountainous and precipitous terrain areas. Secondly, it eliminates some Category II operations that have been safety and effectively conducted for more than 40 years. It has always been permissible to conduct certain Category II operations that used a decision point that was defined either by a barometric altimeter or an inner marker. This proposed definition would eliminate those operations. There is no accident or incident history that justifies this proposal and the economic consequences could be very large, especially in the future. Airbus opposes any definition or other regulatory requirement that would prevent, in the future, using a DH in Category I operations or a DA or Inner Marker (or equivalent fix) in Category II operations to define the decision point. The proposed change could have an adverse impact of aircraft design, flight operations, and training. The definitions for the decision points in instrument approaches should not be locked in the past but must be focused on operations in the future performance based NAS and the transition to that state. (Airbus—44)
75.	<i>Final approach fix (FAF):</i> “This term would be added to indicate that a final approach fix is associated with a nonprecision approach.”--AC 120-29A removes the term non-precision approach. (Delta—18)
76.	<i>Final Approach Fix (FAF):</i> “...a final approach fix is associated with a nonprecision approach.” This definition is not supported by AC120-29A: “The fix from which the final approach to the airport is executed....” AC120-29A does not differentiate between a nonprecision and a precision approach. (Rackley—24) Final Approach Fix: “...beginning of a nonprecision final approach segment...” This definition is not supported by AC120-29A. (Rackley—24)
77.	IAP Within the title Instrument approach procedure (IAP), the word “approach” could be removed. The statement in paragraph (2) of the text allows for the application where “...en route flight may begin”, which is not necessarily restricted to being on an “approach”. This could be confusing in developing future airspace enhancement strategies and applications of technology. <i>Proposed resolution:</i> Review the context of the phrase to determine if “approach” is required. If not, remove it from the statement. (ATA—20)
78.	<i>Instrument Approach Procedure (IAP):</i> This is included in AC120-29A Appendix 1 Acronyms. (Rackley—24)
79.	Minimum Descent Altitude (MDA): “The definition of MDA would be revised to change the words “final approach” to “nonprecision final approach”....” This definition is not supported by AC120-29A , and is contradictory to the AC which in Section 3.4.a. explicitly drops use of the term “nonprecision” to reduce confusion which exists with use of this term. (Rackley—24) Minimum Descent Altitude (MDA): “...on a nonprecision final approach...” This definition is not supported by AC120-29A (Rackley—24)
80.	Night: If accepted, the revision of the definition of “night” has the potential to affect operations. Delta is concerned how the FAA intends to disseminate actual night time information at specific locations to the users for the purposes of MEL and legality considerations. (Delta—18)
81.	Night: The FAA is proposing to revise the definition of the term “night” to reflect that local night may differ from the times published in the American Air Almanac. This concept of local night could limit operations at a particular location when the FAA determines it to be necessary for the safety of operations, for example, when terrain causes sunset significantly earlier than the Almanac indicates. American Trans Air is concerned how the FAA intends to disseminate regulatory night time information at these unique locations for the purposes of MEL and other CFR night requirements. (Amer Trans—25)
82.	Night Where would local night be published? How does the FAA calculate this? Without a definitive source, a pilot is left wondering when night begins. This concept will be very difficult for pilots to comply with. (RAA—31)
83.	Night: AOPA opposes the proposed change to (the definition) of night without clarification of the FAA’s intent. AOPA’s involvement in various forums and advisory committees has not revealed any plan by the FAA to support this change. Before changing the definition, the FAA should carefully evaluate the operational impacts that will be imposed on the service providing elements of the FAA. How will the FAA disseminate information on “local night” for over 18,000 landing facilities in the NAS? AOPA urges the FAA to delay any changes to this definition until a better understanding of the operational implementation of “local night” would be applied. (AOPA—34)
84.	Night, Item 2, 77340 Comments: Leave as currently defined because the revision has the potential to limit operations at a particular location at the discretion of the FAA, and will lead to confusion and inconsistencies at different locations. There is concern as to how the FAA intends to disseminate actual nighttime information at specific locations for the purpose of MEL and legal considerations.
85.	Resolution: Delete proposed change to definition. (ATA—41)
86.	Night, Item 2, 77340 Comments: The term night is widely used and understood by the aviation community. Change to this term does not add anything of value and simply creates confusion for no apparent benefit. (AA-

	Comments
	42)
87.	“Night”: The proposed redefinition of “night” is unnecessary and should be removed from this NPRM. The distinctions being drawn or inferred between day and night for instrument procedure design or specification are inappropriate. If instrument procedures are properly designed, there is no need to draw this subtle distinction or make a change. Either the visual reference requirements of §91.175 are met at minima, or they are not. This redefinition of “night” risks introducing retroactive confusion with millions of pilots’ and operators’ logbook systems and time calculations, and provides no safety benefit. (Boeing—43)
88.	<u>Nonprecision approach procedure (NPA)</u> : AC120-29A removed the term non-precision. As written now, the NPRM would be developing a new definition. (Delta 18)
89.	Nonprecision Approach Procedure : “FAA is proposing to revise the definition of this term so there is no reference to “electronic glide slope.” This definition is not supported by AC120-29A , and is contradictory to the AC which in Section 3.4.a. explicitly drops use of the term “nonprecision” to reduce confusion which exists with use of this term. (Rackley—24)
90.	<i>Nonprecision approach procedure (NPA)</i> , Precision approach procedure (PA), and Precision final approach fix (PFAF) ...Ref: AC 120-29A, Page 2, Paragraph 3.4 Category I, II, and III Terminology: “The use of the term “non-precision” has been dropped within this AC to reduce confusion which exists with use of this term with current and future systems and authorizations, particularly with Vertical Navigation (VNAV) and Area Navigation (RNAV), and with other approaches that may incorporate the use of barometric VNAV to provide a stabilized descent path to a runway.” <i>Proposed resolution</i> : Include in the preamble to the FAR Part 1 – Definitions and Abbreviations that the terms NPA, PA and PFAF, while being part of the terminology used in the past, the do not add clarification nor correct context to the future approach implementation strategies and thus have been removed. (ATA—20)
91.	<ul style="list-style-type: none"> Nonprecision approach procedure (NPA) The term NPA would now apply only to a procedure with NO vertical guidance. This is a change from long-standing practice, and also will impact training and other documentation throughout the industry. (RAA-31)
92.	Non-precision Approach : AOPA concurs that a non-precision approach is traditionally considered an approach without vertical guidance (glide slope or VNAV functionality). The comments pertaining to the relationship of APV procedures and “precision approaches” create concerns that need to be addressed by the FAA prior to issuing a final rule. (AOPA—34)
93.	<p>Reference Nonprecision approach procedure (NPA), Precision approach procedure (PA), and Precision final approach fix (PFAF), Item 2, 77340 Comments: Review the proposed definitions of terms and concepts for consistency with their use in other FAA technical guidance, particularly terms that have limited future application. If the terms are not used consistently, the discrepancies will be contrary to FAA’s longstanding commitment to harmonization and simplicity. For example, Advisory Circular 120-29A, Page 2, Paragraph 3.4 Category I, II, and III Terminology provides: “The use of the term “non-precision” has been dropped within this AC to reduce confusion which exists with use of this term with current and future systems and authorizations, particularly with Vertical Navigation (VNAV) and Area Navigation (RNAV), and with other approaches that may incorporate the use of barometric VNAV to provide a stabilized descent path to a runway.” It seems appropriate to continue the policy contained in AC 120-29A, rather than to continue to include the terms in the regulation. Current changes in TERPs will enable the use of linear criteria for an approach construction. This will enable a higher level of precision to be applied to the approach, and will further blend the differences currently held between precision and nonprecision. The future use of a required navigation performance will more specifically and qualitatively define the procedure and associated minimums as applied to the approach. The terms lose their meaning when examined against the current developments and implementations planned. Continuing use of these terms will only add further confusion as the new procedures are developed and applied. The legacy of these terms will continue, but the FAA should minimize their usage. Despite the adage that “Old habits die hard,” the FAA should not continue to encourage use of these terms.</p> <p>Resolution: Delete the proposed terms. Additionally, coordination with text to the draft of Order 8260.RNP should be consistent with the adopted language.</p> <p>Resolution for Comments 7 and 8: Include language in the preamble to the FAR Part 1 DEFINITIONS AND ABBREVIATIONS stating that the terms “nonprecision approach procedure” (NPA), “precision approach” (PA), and “precision final approach fix” (PFAF) have been deleted as these definitions no longer provide clarification nor correct context to future approach implementation strategies. Use of the terms “authorized” or “approved” in relation to approach, departure, or arrival procedures would give the needed regulatory authority, while allowing future developments and inherent flexibilities. Further definitions can be included within air carriers Operations</p>

	Comments
	Specifications. Continue to coordinate the development of wording compatible with existing harmonized guidance, specifically, AC 120-28D, and AC 120-29A, to enable the implementation of future approach strategies without creating conflicts (as do the proposed changes). (ATA-41)
94.	Reference Nonprecision approach procedure (NPA), Precision approach procedure (PA), and Precision final approach fix (PFAF), Item 2, 77340. Comments: The terms ILS approach and non-ILS approach as specified in AC120-29A are being incorporated by many airlines due to their relevance to existing fleet capabilities and for their future benefits with proliferation of RNP RNAV. The term non-precision should be dropped due to its antiquated and inappropriate application in modern jet transports. Advisory Circular 120-29A, Page 2, Paragraph 3.4 Category I, II, and III Terminology provides: "The use of the term "non-precision" has been dropped within this AC to reduce confusion which exists with use of this term with current and future systems and authorizations, particularly with Vertical Navigation (VNAV) and Area Navigation (RNAV), and with other approaches that may incorporate the use of barometric VNAV to provide a stabilized descent path to a runway." It seems appropriate to continue the policy contained in AC 120-29A, rather than to continue to include them in the regulation. (AA—42)
95.	Precision Approach (PA) and Non-Precision Approach (NPA): The terms "precision approach" and "non-precision approach" are outdated and have lost their meanings. Their use should be discontinued beginning with this rule, and they should be removed from the NPRM. These obsolete terms and concepts do not appropriately address modern avionic systems, flight procedure methods, criteria used (e.g., linear versus angular criteria), safety risk, path-following performance, necessary flight path provisions, failure responses, or navaids/ sensor systems used. We suggest the use instead of the more general term "instrument approach" where necessary in the rule. Until removed or revised, any references to "non-precision approach" that remain in other sections of 14 CFR should now be interpreted to mean any type of instrument approach other than Instrument Landing System (ILS), Microwave Landing System (MLS), or GPS Landing System (GLS). (Boeing—43)
96.	<u>Precision approach procedure (PA)</u> : AC120-29A definition is different. (Delta-18)
97.	Precision Approach procedure : AC120-29A does not use this terminology, but rather uses CAT I, II, III, etc. (Rackley—24)
98.	Precision approach procedure (PA). The inclusion of VASI, PAPI, etc. is not contained within this discussion. In accordance with existing precision approach systems, including VASI, PAPI, etc, this must be added. (RAA-31)
99.	Precision approach : This definition should be revised in such a way to clearly differentiate between an approach procedure with vertical guidance and a precision approach. An ILS and APV procedure could have the same minimums. What differentiates the two operationally? If a pilot flies an APV approach, he should be given the same operational credit as having flown an ILS approach (except for CAT II/ CAT III operations). AOPA proposes that the FAA add "APV" to the list of precision approach types. (AOPA—34)
100.	Precision Final Approach Fix (PFAF) : "...a PFAF is associated with a precision or APV approach procedure." This definition is not supported by AC120-29A , which uses only the term FAF to apply to all approaches. AC120-29A also does not use Precision approach or APV. (Rackely—24) Precision Final Approach Fix (PFAF) : "...defines the beginning of the <i>precision</i> or <i>APV</i> final approach segment..."--This definition is not supported by AC120-29A. (Rackley—24)
101.	Nonprecision approach procedure (NPA), <i>Precision approach procedure (PA)</i> , and <i>Precision final approach fix (PFAF)</i> ...Ref: AC 120-29A, Page 2, Paragraph 3.4 Category I, II, and III Terminology: "The use of the term "non-precision" has been dropped within this AC to reduce confusion which exists with use of this term with current and future systems and authorizations, particularly with Vertical Navigation (VNAV) and Area Navigation (RNAV), and with other approaches that may incorporate the use of barometric VNAV to provide a stabilized descent path to a runway." <i>Proposed resolution</i> : Include in the preamble to the FAR Part 1 – Definitions and Abbreviations that the terms NPA, PA and PFAF, while being part of the terminology used in the past, the do not add clarification nor correct context to the future approach implementation strategies and thus have been removed. (ATA—20)
102.	<i>Precision final approach fix (PFAF)</i> . Nonprecision approach procedure (NPA), Precision approach procedure (PA), and <i>Precision final approach fix (PFAF)</i> ...Ref: AC 120-29A, Page 2, Paragraph 3.4 Category I, II, and III Terminology: "The use of the term "non-precision" has been dropped within this AC to reduce confusion which exists with use of this term with current and future systems and authorizations, particularly with Vertical Navigation (VNAV) and Area Navigation (RNAV), and with other approaches that may incorporate the use of barometric VNAV to provide a stabilized descent path to a runway." <i>Proposed resolution</i> : Include in the preamble to the FAR Part 1 – Definitions and Abbreviations that the terms NPA, PA and PFAF, while being part of the terminology used in the past, the do not add clarification nor correct context to the future approach

	Comments
	implementation strategies and thus have been removed. (ATA—20)
103.	Route Segment definition: The FAA should include in the definition, the fact that the “FIX” will be named, charted and available in navigation databases. (AOPA—34)
	§1.2
104.	The listings need to reflect the appropriate changes proposed in [comments to 1.1]a above (ATA on “precision/nonprecision”). <i>Proposed resolution:</i> Include appropriate changes when resolving the issues indicated in [comments to 1.1] above. (ATA—20)
105.	APV—NPA—PA— These (definitions nor abbreviations) are not supported by AC120-29A. (Rackley—24)
106.	Is it FAA’s intent that the introduction of terms such as APV, PFAF and ATS will now appear throughout equipment and training materials? Will charts now be revised to use these terms? Will the term PFAF now be required on things like FMS CDUs in order to be consistent with charting and training materials? What assurance does industry have that these changes will not be demanded in the future, resulting in significant costs to the industry? (RAA—31)
107.	The NPRM does not mention LPV. How will it be used in the context of the redefinition of approaches and terminology? (RAA-31)
108.	APV, NPA, and PA, Item 3, 77340 Comments: Delete the proposed terms. The inclusion of APV, with the proposed definition, appears designed to designate specific attributes that are currently acceptable to the FAA. Listing these specific attributes as specific approach criteria limits the future application that may be similar, but not the same. Listing and defining these and other specific applications in another document, such as an Advisory Circular, is a better alternative than the prescriptive listing of various approach types. Resolution: Include language in the preamble to the FAR Part 1 DEFINITIONS AND ABBREVIATIONS stating that the terms “nonprecision approach procedure” (NPA), “precision approach” (PA), and “precision final approach fix” (PFAF) have been deleted as these definitions no longer provide clarification nor correct context to future approach implementation strategies. Use of the terms “authorized” or “approved” in relation to approach, departure, or arrival procedures would give the needed regulatory authority, while allowing future developments and inherent flexibilities. Further definitions can be included within air carriers Operations Specifications. Continue to coordinate the development of wording compatible with existing harmonized guidance, specifically, AC 120-28D, and AC 120-29A, to enable the implementation of future approach strategies without creating conflicts (as do the proposed changes). (ATA—41)
109.	APV, NPA, and PA, Item 3, 77340 Comments: Existing terminology in AC120-29A and AC120-28D make the proposed terms unnecessary and confusing. Additionally, future applications using AC120-29A terminology and concepts may be inappropriately constrained by these definitions. (AA—42)
	PART 71
110.	AOPA submits the following comments to the proposed changes to 14 CFR part 71. AOPA urges the FAA to use the term “ATS routes” or Air Traffic Service Routes sparingly, and only in internal orders and procedures design guidance. This term, if broadly utilized, increases the potential for confusion and creates the need for new training without benefit. In order to avoid undermining the use of existing navigation systems, AOPA recommends that the FAA maintain the use of phraseology and terminology such as Victor and Jet airways, in pilot educational materials and on all charting products as well as in air traffic control communications. AOPA encourages the FAA to include charting and air traffic control phraseology information where “RNAV routes” are included as a new airway type in FAA educational materials. Failure to do so may negatively impact general aviation use of RNAV routes. Since December 2000, AOPA has urged the FAA to create GPS based RNAV routes in all airspace (including non-radar airspace) with existing non-precision GPS navigation equipment certified and installed for IFR operations. AOPA requested them because they enable IFR operations at lower altitudes, increase available IFR airspace, and increase direct routing in all airspace areas. Besides the tremendous safety and efficiency benefits, RNAV routes encourage equipage with GPS, consistent with the FAA’s long term strategic planning of National Airspace System modernization. Specifically, AOPA has identified several applications for GPS based RNAV routes, and AOPA expects to see the following capabilities emerge concurrent with the publication of this final

	Comments
	<p>rule. Should this not be the case, the FAA should modify additional portions of 14 CFR part 71, sufficient to enable the following benefits to general aviation:</p> <ol style="list-style-type: none"> 1. Reduce the minimum en route altitude required on victor airways when using GPS. The reduction should be to the minimum altitude necessary for minimum communication with ATC and/or terrain clearance limits. 2. Increase access to Class B airspace by establishing RNAV routes between 3,000-8,000 feet Above Ground Level (AGL) through the lateral and vertical limits of the class B airspace. Additional access to Class B airspace is also attainable by establishing specific routes for ingress/degress to satellite airports by small, slow general aviation aircraft equipped with GPS. 3. Increase access to special use airspace by publishing routes independent of NAVAID citing. This permits more efficient IFR operations at altitudes below 18,000 feet. 4. Enable RNAV access to geographic areas where failing navigation infrastructure is preventing pilots to access airports IFR (e.g. the outer banks of North Carolina). Without RNAV routes, this situation can result in marginal VFR operations, which traditionally have higher safety risks over IFR operations. While many in general aviation anticipate the new capabilities that the rulemaking should enable, AOPA emphasizes that the rules should not adversely impact the majority of the general aviation operations which are not equipped with IFR GPS navigation equipment. (AOPA—23)
	<u>§71.11</u>
111.	Drop paragraphs a, b, and c. Rewrite the whole 71.11 to read as follows: “Unless otherwise specified, ATS routes include the protected airspace dimensions as determined acceptable by the Administrator.” (Vaughn/Continental—19)
112.	Paragraph (b) “...would differ from the text of 71.75 by referencing FAA Order 8260.3 (TERPS) as the source for criteria regarding ATS route dimensions and protected airspace. Comment: There is no mention of giving ATS routes an RNP value. Part 71.75 discusses the extent of Federal airways, the airspace within 4nm of the centerline, the 4.5 degree diverging angles beyond 51nm from the navaid, etc. With the advent of RNP these definitions may be obsolete and should at least be looked at. (Rackley—24)
113.	Drop paragraphs a, b, and c. Rewrite the whole 71.11 to read as follows: “Unless otherwise specified, ATS routes include the protected airspace dimensions as determined acceptable by the Administrator.” (Amer Trans—25)
114.	The introduction to FAR 71.11 should be revised to include language to allow the FAA to use alternative criteria when necessary, or alternative means of authorization, or alternative provisions in addition to Order FAA 8260.3 (Boeing—43)
	<u>§71.13</u>
115.	Paragraph (b), rewrite as follows: “(b) In subpart E of this part: (1) Federal Airways. (2) RNAV Routes.” (Vaughn/Continental Airlines—19)
116.	71.13 Classification of Air Traffic Service (ATS) Routes. Under 71.13 (b)--rewrite as follows: (b) In subpart E of this part: (1) Federal Airways. (2) RNAV Routes. (Amer Trans—25)
	<u>§71.75</u>
117.	Section 71.75 Extent of Federal Airways “...would be removed and used as the basis for a new Part 71.11. See comments [Rackley’s on §71.11] concerning ATS routes and their extent. (Rackley—24)
	<u>PART 91</u>
	<u>§91.129</u>
118.	Further, in discussion of the proposed Rule on page 77331, Section 91.129 Operations in Class D Airspace, paragraph (2), the indication is that “glide path” includes both ILS and APV. This should be extended to all applicable procedures, including ILS. The term needs to be applicable to additional applications without deterring continued development of procedures. <i>Proposed resolution:</i> Remove the word “glide” from definitions

	Comments
	and uses within the Rule, unless it is determined that specific reasoned results are required and directed by the application of the word “glide” to the text. (ATA—20)
119.	Section 91.129 : The phrase “served by an ILS” would read “served by and <i>APV or precision approach</i> ”. This terminology is not supported by AC120-29A. (Rackley—24)
120.	Section 91.129: The term “glide slope” would read “glide path” because ...”glide path” includes both ILS and APV. This terminology is not supported by AC120-29A. Comment: “Glide Path” is not explicitly defined in AC120-29A. Glide Path Angle is defined. (Rackley—24)
121.	Section 91.129: “Reference to outer marker would be replaced with “ <i>Precision Final Approach Fix.</i> ” This terminology is not supported by AC120-29A. (Rackley—24)
122.	91.129 (2): “...operations with <i>vertical guidance (APV) or a precision approach...</i> ” This terminology is not supported by AC120-29A. (Rackley—24)
123.	91.129 (2)(i): “...the published <i>Precision Final Approach Fix (PFAF)</i> ...” This terminology is not supported by AC120-29A. (Rackley—24)
124.	91.129 and 91.131 Revise to delete APV and ILS as follows: A large or turbinepowered airplane approaching to land on a runway served by an instrument approach providing vertical guidance shall, if the airplane is equipped, fly that airplane at an altitude at or above the glide path between the final approach fix (or point of interception of glide path, if compliance with the applicable distance from clouds criteria requires interception closer in) and the DA/DH; and...” (Amer Trans—25)
125.	<p>(e)(2), (e)(2)(i), Item 15, 77340 Comments: Include language in the preamble to the FAR Part 1 DEFINITIONS AND ABBREVIATIONS stating that the terms “nonprecision approach procedure” (NPA), “precision approach” (PA), and “precision final approach fix” (PFAF) have been deleted as these definitions no longer provide clarification nor correct context to future approach implementation strategies. Use of the terms “authorized” or “approved” in relation to approach, departure, or arrival procedures would give the needed regulatory authority, while allowing future developments and inherent flexibilities. Further definitions can be included within an air carrier’s Operations Specifications. Continue to coordinate the development of wording compatible with existing harmonized guidance, specifically, AC 120-28D, and AC 120-29A, to enable the implementation of future approach strategies without creating conflicts (as do the proposed changes).</p> <p>Discussion on page 77331, Section 91.129 Operations in Class D Airspace, paragraph (2), indicate that “glide path” includes both ILS and APV. This should be extended to all applicable procedures, including ILS. The term used to define the vertical path needs to be applicable to other procedures without deterring continued development.</p> <p>Resolution: Remove the word “glide” from definitions and uses within the proposal, unless it is determined that specific reasoned results are required and directed by the application of the word “glide” to the text. The title Instrument approach procedure (IAP) may need to be revised to allow application to other than an “approach.” The statement in paragraph (2) of the text allows for the application where “...en route flight may begin”, which is not necessarily restricted to being on an “approach”. This could be confusing when developing future airspace enhancement strategies and applications of technology. During the final review, determination should be made if the word “approach” is applicable and necessary for clarification. (ATA—41)</p>
	<u>§91.131</u>
126.	(See comment to 91.129 from American Trans Air—25 above) Revise to delete APV, etc.
127.	In the preamble of the regulations, AOPA requests that the FAA include IFR certified GPS equipment as an example of a “suitable RNAV system”. Such clarifying language establishes a regulatory approval for the use of this equipment as an option to meet existing mandated equipage requirements in lieu of the equipment (VOR, DME etc.) currently required to operate in certain airspace areas such as Class B airspace and at altitudes of Flight Level 240 and above. (AOPA—34)
	<u>§91.175</u>
128.	Paragraph (f) Normally, takeoff minimums are published with respect to an obstacle DP if needed to ensure a safe departure. However, most airports also have published Standard Instrument Departure (SID) procedures which may or may not be used for terrain avoidance. Additionally, there is inconsistency in the manner which minimums are published on these procedures. Some have takeoff minimums published, some refer to the airport

	Comments
	page takeoff minimums, and others say nothing. It is very rare that ATC assigns an obstacle departure procedure. The FAA would need to clearly indicate on each departure procedure, SID or Obstacle DP, the appropriate minimums. If taken literally, the only procedure to fly in IMC would be the obstacle departure procedure. Delta does not believe this is what the FAA intended. (Delta --18)
129.	(f) Civil airport takeoff minimums: "...where takeoff minimums are based on a specified route, persons operating the aircraft must comply with that route unless an alternative route has been assigned by ATC."-- Comment: This may well be a sleeper: Does this invalidate our 10-7 Engine Failure Turn Procedure Programs? (Rackley—24)
130.	Paragraph (h) Delta recommends the table be kept in the FAR to ensure operations are based on a regulatory source. (Delta—18)
131.	(h): "...would be amended by <i>removing</i> the RVR table from paragraph (h)(2) and replacing it with a reference to TERPS which contains the RVR table." Comment: This refers to TERPS Paragraph 335, Table 7. We have the opportunity to harmonize a number of documents at this juncture. AC120-29A Sections 4.3.5 and 4.3.6 point the operator to the Ops Specs detailed in Appendix 7, Ops Spec 051, which harmonizes the RVR and Visibility. Let's update TERPS, the AIM, the Instrument Flying Handbook, and the Flight Information Publication, so that they all agree. Rather than removing the RVR table, reproduce Table 1 and 2 from AC120-29A, Appendix 7, Ops Spec 051. (Rackley—24)
132.	(h) Do not move the RVR conversion to an FAA Order that can be changed without public notice. If the table is removed it should be relocated to the operational Advisory Circulars for operations requiring RVR (Acs 120-28 &29). This would ensure change, if any, would be coordinated with affected users. Additionally, the table should be updated with the values currently in AC120-28 &29. Note the RVR table also appears in the Aeronautical Information Manual (AIM), the Instrument Flying Handbook, and in the Flight Information Publications. (Amer Trans—25)
133.	The change to Paragraph (h) should not solely reference FAA Order 8260.3, but should list all publications where the FAA makes the RVR table available for pilots. At a minimum, the Aeronautical Information Manual (AIM) should be mentioned in the regulation. (AOPA—34)
134.	(k): The change to Paragraph (k) should include additional clarifying information to ensure that the intent of the regulation is understood: RNAV equipment, to include IFR approved GPS, can be used to identify certain locations on the ILS. However, AOPA is also concerned that the FAA doesn't rely on the use of such database derived FIXES as the sole means of identifying the key locations on the ILS. Less than one-third of all general aviation aircraft have the equipment necessary to identify a database derived FIX. Therefore, no such use of a FIX (exclusively without other identification options) should be applied to existing ILS installations. AOPA is strongly opposed to any ILS implementation where RNAV equipage (or the ability to identify a FIX from a database) is a required component for completion of the approach. This virtually mandates the use of GPS for general aviation aircraft desiring to access "non-GPS" procedures. Lastly, AOPA requests that Paragraph (K) also permit the pilot to use the glide slope and altitude crosscheck as a viable and acceptable means to substitute for an outer marker on an ILS. (AOPA—34)
135.	91.175 and 97.10. These two sections provide for alternate means of developing instrument procedures. This capability must be maintained. New technologies may come forward that allow an operator with advanced avionics to accomplish something for which there is no criteria today. Continuing with these two sections will allow future technologies to find early implementation, instead of waiting for formal TERPS criteria to be developed providing Part 97 procedures using this new technology. (Vaughn—Continental—37)
136.	The proposed changes to 91.175 dealing with DA(H) are not necessary. Implementing the proposed changes would mean changing every ILS approach plate. There is no benefit gained by the proposed changes. (Vaughn—Continental—37)
137.	<p>§91.175 Comments: The ATA supports the comments submitted by The Boeing Company, cited here in their entirety. Proposed Revision Language to §91.175:</p> <p>§ 91.175 Takeoff and landing under IFR.</p> <p>(a) Instrument approaches to civil airports. Unless otherwise authorized by the Administrator, when an instrument approach to a civil airport is necessary, each person operating an aircraft, except a military aircraft of the United States, shall use a standard instrument approach procedure prescribed for the airport in part 97 of this chapter.</p> <p>(b) Authorized DA(H) or MDA(H). For the purpose of this section, when the approach procedure being used provides for and requires the use of a DA(H) or MDA(H), the authorized DA(H) or MDA(H) is the highest of the</p>

	Comments
	<p>following:</p> <p>(1) The DA(H) or MDA(H) prescribed by the approach procedure.</p> <p>(2) The DA(H) or MDA(H) prescribed for the pilot in command.</p> <p>(3) The DA(H) or MDA(H) for which the aircraft is equipped.</p> <p>(c) Operation below DA(H) or MDA(H). Where a DA(H) or MDA(H) is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, at any airport below the authorized MDA(H) or continue an approach below the authorized DA(H) unless -</p> <p>(1) The aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and for operations conducted under part 121 or part 135 unless that descent rate will allow touchdown to occur within the touchdown zone of the runway of intended landing;</p> <p>(2) The flight visibility is not less than the visibility prescribed in the standard instrument approach being used; and (3) Except for a Category II or Category III approach where any necessary visual reference requirements are specified by the Administrator, at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:</p> <p>(i) The approach light system.</p> <p>(ii) The threshold.</p> <p>(iii) The threshold markings.</p> <p>(iv) The threshold lights.</p> <p>(v) The runway end identifier lights.</p> <p>(vi) The visual approach slope indicator.</p> <p>(vii) The touchdown zone or touchdown zone markings.</p> <p>(viii) The touchdown zone lights.</p> <p>(ix) The runway or runway markings.</p> <p>(x) The runway lights.</p> <p>(d) Landing. No pilot operating an aircraft, except a military aircraft of the United States, may land that aircraft when the flight visibility is less than the visibility prescribed in the standard instrument approach procedure being used.</p> <p>(e) Missed approach procedures. Each pilot operating an aircraft, except a military aircraft of the United States, shall immediately execute an appropriate missed approach procedure when either of the following conditions exist:</p> <p>(1) Whenever the requirements of paragraph (c) of this section are not met at either of the following times:</p> <p>(i) When the aircraft is being operated below MDA(H); or</p> <p>(ii) Upon arrival at the missed approach point, including a DA(H) where a DA(H) is specified and its use is required, and at any time after that until touchdown.</p> <p>(2) Whenever an identifiable part of the airport is not distinctly visible to the pilot during a circling maneuver at or above MDA(H), unless the inability to see an identifiable part of the airport results only from a normal bank of the aircraft during the circling approach.</p> <p>(f) Civil airport takeoff minimums. Unless otherwise authorized by the Administrator, no pilot operating an aircraft under parts 121, 125, 127, 129, or 135 of this chapter may takeoff from a civil airport under IFR unless weather conditions are at or above the weather minimum for IFR takeoff prescribed for that airport under part 97 of this chapter. If takeoff minimums are not prescribed under part 97 of this chapter for a particular airport, IFR takeoff minima for aircraft operating under those parts are ½ statute mile visibility.</p> <p>(g) Military airports. Unless otherwise prescribed by the Administrator, each person operating a civil aircraft under IFR into or out of a military airport shall comply with the instrument approach procedures and the takeoff and landing minimum prescribed by the military authority having jurisdiction of that airport.</p> <p>(h) Comparable values of RVR and ground visibility.</p> <p>(1) Except for Category II or Category III minimums, if RVR minimums for takeoff or landing are prescribed in an instrument approach procedure, but RVR is not reported for the runway of intended operation, the RVR minimum shall be converted to ground visibility in accordance with approved Operations Specifications for that operator, if Operations Specifications are applicable, or in accordance with the following table.</p> <p>RVR (feet) Visibility (statute miles)</p> <p>1,600 1/4</p> <p>2,400 1/2</p> <p>3,200 5/8</p>

	Comments
	<p>4,000 3/4 4,500 7/8 5,000 1 6,000 1 1/4</p> <p>(i) Operations on unpublished routes and use of radar in instrument approach procedures. When radar is approved at certain locations for ATC purposes, it may be used not only for surveillance and precision radar approaches, as applicable, but also may be used in conjunction with instrument approach procedures predicated on other types of radio navigational aids. Radar vectors may be authorized to provide course guidance through the segments of an approach to the final course or fix. When operating on an unpublished route or while being radar vectored, the pilot, when an approach clearance is received, shall, in addition to complying with § 91.177, maintain the last altitude assigned to that pilot until the aircraft is established on a segment of a published route or instrument approach procedure unless a different altitude is assigned by ATC. After the aircraft is so established, published altitudes apply to descent within each succeeding route or approach segment unless a different altitude is assigned by ATC. Upon reaching the final approach course or fix, the pilot may either complete the instrument approach in accordance with a procedure approved for the facility or continue a surveillance or precision radar approach to a landing.</p> <p>(j) Limitation on procedure turns. In the case of a radar vector to a final approach course or fix, a timed approach from a holding fix, or an approach for which the procedure specifies "No PT," no pilot may make a procedure turn unless cleared to do so by ATC.</p> <p>(k) Instrument Procedure Component substitution. Fixes, components, or navigation methods may be substituted in an instrument approach procedure as noted by that instrument procedure, as noted by Operations Specifications, or as otherwise authorized by the administrator. If not otherwise restricted or limited, a compass locator or precision radar may be substituted for the outer or middle marker. RNAV, DME, VOR, or non-directional beacon fixes authorized in the standard instrument approach procedure or surveillance radar may be substituted for the outer marker. Applicability of, and substitution for an inner marker for Category II or III approaches is determined by the appropriate part 97 approach procedure, letter of authorization, or operations specification pertinent to the operations.</p> <p>(l) Notwithstanding provisions of paragraphs c(2), (d), and (e) above, the Administrator may approve use of systems and procedures meeting requirements other than those specified, if:</p> <ol style="list-style-type: none"> 1) The systems and procedures proposed are shown to have equivalent or better performance than other approved systems, are operationally safe, effective, and reliable for approach, landing, missed approach, or takeoff, as applicable, and, 2) If visual reference requirements apply, the pilot is able to determine that flight visibility is adequate for safe takeoff or landing. (ATA—41)
138.	§91.175f Comments: The proposed revision to 91.175(f) implies that only an all-engine departure procedure may be flown. In the event of an engine failure, the crew should be allowed to fly a special engine-out departure procedure as evaluated and published by individual airlines. (AA—42)
139.	Section 91.175 should be restructured to accommodate comments in this letter. We have provided proposed version in Enclosure 2. Further, an additional paragraph should be added to explicitly facilitate introduction of new technology for low visibility approach and landing, when it can be shown to be safe and appropriate, and specifically allowing the Administrator to make such authorizations through Operations Specifications or other means. (Boeing—43)
140.	<p>Section 91.175 and Section 97.1 Airbus disagrees with the proposed change to Section 91.175 (f) and the intent stated in the preamble that "Takeoff minimums are determined from the analysis of a particular runway environment. Thus the departure procedure must be followed for a particular runway to ensure adequate obstacle clearance."</p> <p>Airbus also disagrees with the proposed change to Section 97.1 and the intent stated in the preamble that "Proposed 97.1 would clarify that published civil takeoff weather minimums are based on a specified route, and that pilots must comply with that route unless an alternative route has been assigned by ATC."</p> <p>For air carrier operations, the proposed changes are fundamentally flawed and create significant safety problems and impose unreasonable economic burdens on the air carriers. These changes are not compatible with the way air carriers have been safely and efficiently operating for more than 40 years. The changes are not justified by any air carrier accident or incident history.</p>

	Comments
	<p>Airbus acknowledges that pilots and dispatchers need to know that the takeoff minimums developed in accordance with Part 97 assume that the aircraft will adhere to the published flight track. However, it is unnecessary, unsafe, and economically onerous to require air carrier pilots to adhere to these tracks under certain circumstances. It has been a commonly accepted safe operating practice for many decades for air carriers to use a flight track in determining compliance with FAR 121.189 that is significantly different from the track published in the FAR Part 97 procedure.</p> <p>Compliance with FAR 121.189 is demonstrated on an aircraft-by-aircraft and flight-by-flight basis, based on the specific circumstances associated with that flight. If it is necessary to use an alternate flight track during a portion of the departure to demonstrate compliance with FAR 121.189, the alternate route and the commit point are defined prior to takeoff. In such a case, it would be unsafe for the pilot to continue to fly the published departure flight path if an engine failure occurred prior to passing the commit point.</p> <p>In these situations, it is unreasonable to require the pilot to immediately request and receive a new ATC clearance to comply with the FAR 121.189 routing. It is also unreasonable to expect the pilot to immediately exercise "emergency authority" in these cases since the route is preplanned and ATC has knowledge of the alternative routing. When an engine failure occurs, the pilots immediate actions must always be to maintain aircraft control, establish the aircraft on the proper flight path, perform the immediate action items on the checklist, and then communicate with ATC, as required. (Airbus—44)</p>
	§91.177
141.	Change to read: However, if both a MEA and a MOCA are prescribed for a particular route or route segment, a person may operate an aircraft below the MEA down to, but not below, the MOCA. Except when using VOR navigation, operations at MOCA beyond 22 NM of the VOR concerned (based on the pilot's reasonable estimate of that distance) is not permitted. This change allows other navigation without further specifying types of avionics RNAV, GPS etc. (Amer Trans—25)
142.	<p>The preamble discussion pertaining to a broad and comprehensive requirement for surveillance and/or communication on published routes is a significant change and severely impacts general aviation operations. Many IFR general aviation operations are conducted outside of radar contact while en route. Many more approach and departure procedures are flown to and from airports in non-radar environments. Non-radar separation procedures enable pilots of general aviation aircraft to enjoy the flexibility and freedom of general aviation. While en route, general aviation aircraft remain at lower altitudes to access useable, safe airspace. AOPA members indicate that with approval to operate at the Minimum Obstruction Clearance Altitude (MOCA) -as enabled by changes to this very section- the use of minimum altitudes along airways will increase. Whether to avoid adverse weather conditions (icing or strong head-winds) or to utilize certain performance characteristics of the aircraft they fly, the use of low-altitude IFR routes will expand with RNAV (GPS) equipage.</p> <p>Suffice to say, non-radar air traffic control services remain an integral part of general aviation operations. Many of these operations are and will be outside surveillance service levels. Therefore, the FAA should make every effort to accommodate area navigation operations (when either on routes, when on random flight trajectories or when conducting terminal area procedures) outside of radar coverage. The regulatory proposal appears to revoke these capabilities and not expand them. Clarification from the FAA is needed to ensure that the intent of these changes is to support new services to persons operating with new, beneficial equipment. (AOPA—34)</p>
143.	§91.177, Minimum altitudes for IFR operations (a)(2)(i), and (a)(2)(ii), Item 18, 77341 Comments: Applications should allow the inclusion of RNP values, and not just a specific value of 4 nm for all instances. When applicable navigation requirements are established, the ability to reduce the acceptable tolerances should be offered or allowed due to increased navigation accuracy prescribed by applying RNP requirements. (ATA—41)
144.	§91.177, Minimum altitudes for IFR operations (a)(2)(i), and (a)(2)(ii), Item 18, 77341 Comments: Applications should allow the inclusion of RNP values, and not just a specific value of 4 nm for all instances. When applicable navigation requirements are required the ability to reduce the acceptable tolerances should be offered or allowed due to increased navigation accuracy prescribed by applying RNP requirements. (AA—42)
	§91.205

	Comments
145.	AOPA objects to the FAA's proposal to reduce the altitude at which Distance Measuring Equipment (DME) is required. Contrary to the FAA's statements on page 77337 of the Federal Register (Vol. 67, No. 242 / Tuesday, December 17, 2002) this proposed change would impose an obligation to change (or supplement) current navigation systems on certain aircraft and the proposed changes <i>would</i> impose costs. The FAA fails to disclose the benefit to users of their mandated equipage, and the FAA fails to acknowledge any system efficiency gains or safety enhancements that would accompany such a mandatory equipage requirement at that reduced altitude. In short, the FAA has failed to justify the necessity of this change, other than to briefly mention consistency with ICAO derived airspace designs. AOPA objects to such rational and reemphasizes the fact that it appears the United States is following global trends instead of setting them. (AOPA—34)
146.	The altitude above which DME is required should not be lowered from FL240 to FL180, as proposed in the NPRM [i.e., §91.205(e)]. The reason DME was originally specified above FL240 was to address lead turn radius at high true airspeed, not necessarily to correlate with airspace definition. FL240 should be retained, and RNAV methods should also be permitted in lieu of DME as proposed. (Boeing)
	PART 97
	§97.1
147.	Proposed Section 97.1(b), Departure Procedures: The proposed §97.1(e) is in conflict with §121.189 (Airplanes: Turbine engine powered: Takeoff limitations) and should not be adopted without major revision. It would create significant air carrier safety problems and takeoff weight penalties with no safety benefit in return. It essentially invalidates current air carrier takeoff analyses at many locations where §121.189 compliance requires use of a different safe engine-out flight path than is specified for ATS departure procedures, or by an all-engine departure defined path using criteria of U.S. TERPS. As written, it does not appear to accommodate elements of safe flight, including necessary weather deviations and non-normal situations such as engine failure. If the objective is intended to be coordinated with air traffic control, then it would not be appropriate to be specified in Part 97. If specified at all, it would need to be cited in Part 91, or alternatively in Part 121, 135, 125, or 129. (Boeing—43)
148.	SEE AIRBUS COMMENT (#44) TO 91.175 above.
	§97.3
149.	97.3(b) should include a statement clarifying the expected aircraft performance when flying a Departure Procedure, i.e. all-engine, normal aircraft performance for TERPS-based procedures. (Boll—30)
150.	Under Section 97.3 Symbols and Terms Used in Procedures: As currently proposed, "This proposal would also add the term "helipoint," which is normally the center point of the touchdown and lift-off area (TLOF). It is usually a designated arrival and departure point located in the center of an obstacle-free area, 150-foot square, overlying an approved landing area, where the approach may be terminated in a hover or touchdown. The helipad of intended landing may not be located at the helipoint, however." This wording is troublesome in that many heliports do not have a 150-foot square "obstacle free area" that complies with this change. Instead, this wording should be changed to "heliport reference point", with an accompanying definition, as worded: "This proposal would also add the term "heliport reference point (HRP)," which is the geographic position of the heliport expressed as the latitude and longitude at: (1) The center of the FATO, or the centroid of multiple FATO's for heliports having visual and nonprecision instrument approach procedures; or (2) The center of the Final Approach Reference Area (FARA) when the heliport has a precision instrument approach procedure." This change is word for word from the latest draft version of the Advisory Circular AC 150/5390-2B Heliport Design. (HAI—40)
151.	Under Section 97.3 Symbols and Terms Used in Procedures (continued): Additional changes that are included in AC 150/5390-2B should also be included to conform in this proposed rulemaking: Recommended Change 1, add: "This proposal would also add the term "Final Approach and Takeoff Area (FATO)," which is defined as an area over which the final phase of the approach to a hover, or a landing, is completed and from which the takeoff is initiated." Recommended Change 2, add: "This proposal would also add the term "Final Approach Reference Area (FARA)," which is defined as an obstacle-free area with its center aligned on the final approach course. It is located at the end of a precision instrument FATO."

	Comments
	<p>Recommended Change 3, add: “This proposal would also add the term “Helipoint”, which is defined as the aiming point for the final approach course. It is normally the center point of the TLOF.”</p> <p>Recommended Change 4, add: “This proposal would also add the term “Heliport”, which is defined as the area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters, together with appurtenant buildings and facilities.”</p> <p>Recommended Change 5, add: “This proposal would also add the term “Touchdown and Liftoff Area (TLOF)”, which is defined as a load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.”</p> <p>HAI urges adoption of these recommended changes that take into account the capabilities of helicopters and better define the parameters of helicopter operations. (HAI—40)</p>
152.	<p>While it would appear that the use of “any NAVAID or FIX to be the reference point” for Minimum Safe Altitudes (MSA) is beneficial, poor selection criteria may increase confusion to pilots if the Fix or NAVAID is not consistent in application. Significant safety issues could develop quickly with poor application of this change. The FAA should simultaneously supplement this change with regulatory guidance that establishes a consistent application of MSA. It should be codified to ensure that there is a regulatory basis driving the selection of the MSA fix or NAVAID.</p> <p>The proposed change of the term “HAT” to Height Above Threshold creates inconsistencies with other terminology used to discuss instrument approach procedures. The glossary indicates that the touchdown zone is, “<i>The first 3,000 feet of the runway beginning at the threshold. The area is used for determination of Touchdown Zone Elevation in the development of straight-in landing minimums for instrument approaches.</i>” The FAA defines “threshold” as, “<i>The beginning of that portion of the runway usable for landing.</i>”</p> <p>AOPA disagrees with the FAA’s assertion that the definition of “HAT” is not operationally significant. Height Above Touchdown provides pilots with much more information about the portion of the runway that a landing will be conducted. The height when only referring to the threshold is misleading because the threshold height may not be the highest point in the “touchdown zone”. General aviation pilots are trained that the “touchdown zone” as defined in the FAA’s Pilot/Controller glossary is substantially larger than the runway threshold and that the highest point in that area provides information about the runway slope characteristics. Therefore AOPA recommends that the current definition of HAT be preserved. (AOPA—34)</p>
153.	<p>The proposed change of meaning of “height above touchdown (HAT)” should not be adopted via this NPRM. It needs additional discussion among the AWO and TAOARC. It is not merely a terminology change. For applications like procedure construction, autoland, or head-up display (HUD) landing capability design, or other uses, it could have adverse consequences that need to be technically considered and addressed. If any change is to made at all, it first should be addressed via AWO coordination; then subsequently via coordinated changes to FAA ACs 120-28D and AC120-29A, JAA references; and then finally updated in other related US references, such as FAA Order 8430.6 (Boeing—43)</p>
154.	<p><i>Definition of HAT</i> Airbus disagrees with the proposed amendment to the definition of HAT and the statement in the preamble that this change is insignificant. There are many good reasons for the existing definition of Height Above the Touchdown Zone. Height above the touchdown zone is a major concept in the design of automatic landing systems and one of the basic principles of Category III operations. This change can have many adverse consequences on aircraft design and potentially on the safety of low visibility operations. There is no accident or incident history that justifies the need for this change. And, the only justification given is to make it consistent with ICAO. The most desirable solution is to align the ICAO definition with the way aircraft are designed, certificated, and operated. (Airbus—44)</p>
155.	<p><i>Unless otherwise specified</i>, visibility minimum means the minimum visibility specified for approach, landing, or takeoff, expressed in statute miles, or in feet where RVR is reported. (Boeing)</p>
	§97.10
156.	<p>Do not delete this. Because these type procedures no longer exist is not sufficient justification. This language does no harm and provides a method of accepting other procedures should the need arise. (Amer Trans—25)</p>
157.	<p>See comments to 91.175 from Vaughn of Continental #37 above</p>
158.	<p>Section 97.10, which describes standard instrument procedures “other than those based on the...TERPS,” should be retained, rather than removed as proposed, for later application of internationally harmonized criteria. (Boeing—43)</p>

	Comments
159.	Comments: The FAA proposes deleting this section of the FAR. It is important that this section remain in place as a means for an operator to implement new technology in a timely manner. Recommendation: Do not remove from the Rule as indicated by this NPRM. (ATA—41)
160.	Comments: This reference should be maintained. Since future RNP RNAV implementation in the US and abroad may not be based on TERPS criteria, this guidance may be needed in the future. (AA—42)
	<u>§97.20</u>
161.	97.20 Do not change: FAR's should not hand off regulatory material to FAA Orders. These Orders then in effect become the rule under complete control of the FAA. The current regulation already identifies U.S Terps. Why is the internal filing system number (xxx.3b) required? There is no need to add 8260.19 to the rule any more than the 6750.24 regarding what must be ancillary components must be operating. How would omitting specific orders in the FAR affect the development of procedures? What value is it to FAA, or the public, to expand the list of Orders listed in the rule. (Amer Trans—25)
162.	FAA Orders 8260.3 and 8260.19 should not be incorporated into the Code of Federal Regulations, as proposed in §97.20. The requirements for developing and processing instrument procedures do not need to be included in the regulations, where they would become even more difficult to change, thus unduly constraining procedural and technical evolution. We request that the FAA explain need for the change and the safety benefits to be derived from it, since this is not clearly explained in the preamble and is not otherwise apparent. (Boeing—43)
163.	Airbus opposes the amendment to Section 97.20 which would incorporate FAA Order 8260.3, "U.S. Standard for Terminal Instrument Procedures (TERPS)", and FAA Order 8260.19, "Flight Procedures and Airspace" into the Code of Federal Regulations. There is no accident or significant incident history that suggests that this change is required for safety reasons. These orders are highly detailed and contain many administrative procedures and processes that are not safety related. Instrument flight procedures have been safely developed and safely used throughout the history of FAR Part 97 (about 40 years) without FAA Order 8260.3 or 8260.19 being incorporated into the Code of Federal Regulations. Airbus believes that this amendment would place significant burdens on the industry by unnecessarily delaying the implementation of new technologies and operational capabilities and by making changes to these Orders even more difficult and time consuming than they already are. Airbus acknowledges and fully supports the need for thorough and thoughtful review of changes to these Orders by industry. Airbus also believes that it is essential to preserve the ability to rapidly correct administrative or technical errors or to quickly incorporate new technologies and operating concepts to enhance safety and improve operating efficiency. Airbus believes that there are many other more effective and efficient ways to achieve this objective without undergoing the onerous process associated with rulemaking, as required by the proposed amendment. (Airbus—44)
	<u>PART 121</u>
	<u>§121.99</u>
164.	ADF believes that the FAA proposal to, "add a requirement for a communication system that would have two-way voice communication capability for use between each airplane and the appropriate dispatch office, and between each airplane and the appropriate ATC unit, for non-normal and emergency conditions," is a significant improvement with regard to safety. Further, the technology exists to comply with this requirement. ADF believes that the technology also exists to allow any digital or data link communication passed between Air Traffic Control and a Flight to be transmitted to the relevant Dispatch Office. ADF encourages FAA to include this capability in the future. A voice conversation greatly increases the quantity and quality of information transfer. (ADF—15)
165.	ADF also agrees that the FAA should define what constitutes "rapid" communication. ADF believes that the proposed 4 minute time limit is both reasonable and technologically achievable. (ADF—15)
166.	In closing, ADF believes that the new requirements of the proposed FAR 121. 99 contribute to aviation safety. (ADF—15)

	Comments
167.	Northwest Airlines is concerned over the proposal to add a definition of “rapid communications” based on a legal interpretation as opposed to operational considerations and experience. The legal interpretation does not consider the realities of international aircraft-to-dispatch communications. The concern over this change is the ability to meet the 4-minute requirement while operating in remote/oceanic regions where the primary communication medium is HF Voice. The process used to exchange communication is complex and requires that initial contact be made through a communication service provider (ARINC) who will then establish a voice connection between the aircraft and dispatch. This is a time consuming process. Additionally, the propagation characteristics of HF radio may also prevent the link from being established within the 4-minute time frame. This is out of the control of the operator and therefore we cannot be held responsible for meeting this criterion so we believe that this change is an unreasonable and unachievable objective. (NWA—17)
168.	Section 121.99, “Communications Facilities”, introduces new requirements which are costly and timely to implement. The main issue lies with the need to have continuous voice capability with the company. There are some operations where certain portions of the route segment have data link capability but not direct voice with company. The entire route has voice with ATC. With 121.99(b) requiring the communication to be independent of the ATC communication system, leads to the conclusion that data link may be used for normal communication but we must also have voice in case of an emergency communication need. It is our position that in an emergency, the operator should be allowed to use ATC as voice if needed. This would require amendment to 121.99(b). Without this latitude, Flag operators presently using data link communication systems to communicate with crews would require either satellite communication system or high frequency radios. We propose the FAA needs to review the limited route/time exposure before requiring continuous voice coverage. (Delta—18)
169.	121.99 Communications facilities--a. The title Communications facilities could be shortened to Communications as the word “facilities” does not add any descriptive value to the title. Possibly in the past when companies had to establish their own system of radio facilities before the full integration and established airspace control by the government and other service providers this was appropriate. Proposed resolution: Remove the word facilities unless it is determined that the specific wording is required to determine the correct application of the Rule. (ATA—20)
170.	121.99 (a) contains requirements that are in direct conflict with the responsibility of the FAA. To establish an unrealistic requirement of being able to establish communications “over the entire route under normal operating conditions,” within a specific time of “less than four minutes” will not support the FAA mandate to promote and support the air transportation infrastructure and encourage the development of air travel. It has not been established that the time requirement is realistic under all normal conditions. It has not been established that four minutes is a necessary time requirement for objective reasons substantiated by data. To invoke this arbitrary time limit as the result of the interpretation included in the supplied Docket information without supporting data is capricious and severely onerous to the portions of the airline industry regulated by the FAA. It does not establish what is possibly intended by the FAA, which could be understood as a reasoned expectation to communicate with the flight crew within a reasonable amount of time. Some determination as to the location of the aircraft, the phase flight, and other operational considerations need to be included in the context of rapidly communicating with the flight crew. Currently, conditions occur in normal operations when the only means of communication is via HF radio. This is operationally acceptable, but may take longer than the prescriptive “four minutes” indicated in the proposed Rule. Many of the current requirements are based on the past unreliability and operational problems of radios. During the final phases of flight it is not reasonable to require the flight crew to respond within four minutes when it is safer to continue the approach to a safe landing and then communicate as requested. Current technologies may have an application to enable communications. Enabling and operational procedures should be included in the discussions establishing the specific requirements. It is suggested that no prescriptive time is accurate, accept that it should be accomplished as appropriate in the interest of the safe operation of the aircraft as determined by the flight crew. Proposed resolution: Review the current operational tasks that require expedited communication with the flight crews and establish a current philosophy of what needs to be communicated, and in what manner will accomplish the required task. When these are determined then an action plan to build on current systems could better support future technologies and related improvements to support these basic philosophies. (ATA—20)

	Comments
171.	<p>121.99 "Communications Facilities": There is some operations where certain portions of the route segment have data link capability but not direct voice with company. NPRM 121.99 introduces a new requirement to have continuous voice capability with the company for non-normal and emergency. This will be costly and take time to implement. The NPRM may be appropriate if 121.351 (c) provided route/time/exposure relief. It's curious why data link may be used for critical normal communication, but we must have voice in the rare event of nonnormal/ emergency. We recommend FAA review the NPRM and provide route/time exposure allowance before requiring continuous voice coverage. The rule should also provide some future effective date that would allow voice equipment to be installed. We also request FAA's assessment of cost estimate to implement this change. Do not include the definition of rapid/reliable < 4-minutes. Legal interpretations made in 1977 may not have considered all the relevant operational issues. While 4-minutes may be a reasonable goal, it's not something to be timed with a stopwatch. Standards like this are better placed as a goal in design standards and certification standards. (Amer Trans—25)</p>
172.	<p>The paragraph below regarding emergency communications is ambiguous. Is the intent that the two types of communication must be capable of being simultaneous? "In addition, the FAA is proposing to add a requirement for a communication system that would have two-way voice communication capability for use between each airplane and the appropriate dispatch office, and between each airplane and the appropriate ATC unit, for non-normal and emergency conditions. The FAA believes it would be necessary from the pilot workload and flight safety standpoints to retain two-way voice communication capability for non-normal and emergency conditions." An operational comment: In reality, there is very little useful info that a crew can obtain from dispatch during the tactical phase of a non-normal / emergency occurrence. There is value, once the emergency is under control, to coordinate further action on a strategic basis with dispatch. Thus the requirement to have simultaneous two-way communication between the aircraft and dispatch & the aircraft and ATC is unwarranted and certainly not worth the cost of the added equipment.</p> <p>The requirement for "rapid communications" needs to be well understood from an operational standpoint. There may be circumstances where this cannot be assured. (RAA—31)</p>
173.	<p>United Airlines is concerned over the proposal to add a definition of "rapid communications" based on a legal interpretation as opposed to operational considerations and experience. The 1977 legal interpretation does not consider the realities of international aircraft-to-dispatch communications. The data used to develop the 4-minute requirement is not applicable, and, therefore, is arbitrary and inappropriate. Our concern over this change is the ability to meet the four-minute requirement while operating in remote/oceanic regions where the primary communication media is HF voice. The process used to exchange communications is complex and requires that initial contact be made through a communications service provider, (such as ARINC), who will then establish a voice connection between the aircraft and dispatch. This is a time consuming process. Additionally, the propagation characteristic of HF radio may also prevent the link from being established within the four-minute time frame. This is out of the control of the operator and, therefore, we should not be held responsible for meeting this criterion. We believe that this change is an unreasonable and unachievable objective. Even with SATCOM-voice capability, there are regions of the world where the four-minute requirement may not be achievable. In addition, this puts an undue economic burden on the carriers to either fully equip with Satcom-voice capability, for those regions where coverage is possible, or invest in new technology that is currently not available. It should also be noted that Controller Pilot Data Link Communications (CPDLC) are the primary communication media in many regions of the world. Aircraft dispatcher data link communications are used extensively as the primary communication link. The use of datalink is consistently faster and more reliable than HF communications. United and other international carriers have conducted Flag operations safely for many years using proven, reliable communication systems and procedures. We know of no compelling operational or safety reason to add this definition of rapid communications and recommend that it be removed from this NPRM. (United—35)</p>
174.	<p>This document is in response to the issue of "Rapid Communications" raised in reference document and directed to clarifying 14 CFR 121.99, intended to "... ensure reliable and rapid communications, under normal operating conditions over the entire route (either direct or via approved point-to-point circuits) between each airplane and</p>

	Comments
	<p>the appropriate dispatch office, and between each airplane and the appropriate air traffic control unit..."</p> <p>The present Long Distance Operational Control (LDOC) services are in economic, physical and operational shambles. Under the present LDOC structure, the impaired revenue picture prevents the modernization and restructuring that would result in rapid and reliable service performance. In this document, we outline an approach toward an effective and efficient global LDOC service. We believe that the approach we recommend will have compelling economic advantages over other alternatives while meeting the four-minute standard for dispatch contact referred to in reference document.</p> <p>The causes of the present decrepitude of LDOC services are several:</p> <ol style="list-style-type: none"> 1. The very triumph in reliability of modern turbine engines over reciprocating engines means that the need for LDOC services per hour of flight is now, and will remain, a small fraction of what it was in 1955. LDOC revenues are permanently reduced. 2. The ease of use of satellite services has further eroded HF LDOC revenues. 3. Because of shrinking revenues, the present HF LDOC infrastructure has atrophied and is totally out of balance with that which is now required. Most service providers use ancient, fixed-tuned transmitters, a multitude of narrow band antennas, frequencies unique to their station, their own operator staff and expensive long-distance dial-up for phone patch. Due to lack of knowledge of current radio propagation conditions, frequencies which would support good service frequently are not guarded. 4. The pilot, who must initiate contact, can be faced with a large choice of service providers and a vast choice of frequencies, many of which either won't work, are not monitored or both. He has no way of knowing which few of the many LDOC frequencies have been chosen by the ionospheric propagation gods to permit reliable communications at the moment between the flight and the desired station. Thus, a desired contact may not be made. <p>A comment regarding the "four minute" proposal (maximum time to make contact with company dispatch) in reference document). RPSI engineers have examined the practicality of "reliable and rapid" LDOC communications in the north polar region. We modeled the radio circuits between all service providers and north polar routes 1, 2, 3, and 4. We selected a period of five minutes to make contact as reasonable and allowed one and one-half minutes per contact attempt. We then asked a very senior B474-400 captain to select frequencies and service providers as a typical flight would have progressed along these routes. In these flight examples we considered and absent any reliable propagation information, the station and frequency selections made by this experienced pilot did not once result in contact within five minutes.</p> <p>The potential for an in-flight emergency always exists. Many regulations have been established which acknowledge the many possibilities. When an emergency occurs, it must be dealt with promptly. Invariably, an emergency is dealt with most effectively if reliable voice communications are available between the pilot and the provider of the service required.</p> <p>The north polar region is extreme, with difficult radio propagation conditions and a paucity of appropriate station assets. Other regions, such as the South Atlantic, Indian Ocean, Africa and Central and South America have different, but difficult radio propagation challenges and a similar paucity of station assets. In none of these cases does the pilot have any informed help in choosing a frequency-station pair. LDOC services in these regions are generally regarded as unsatisfactory.</p> <p>The remedies for this unsatisfactory state of affairs are to be found in the application of modern radio and network engineering and in the use of modern management of the choice of operating frequencies.</p> <p>Contrary to popular belief and general experience, HF can be made quite reliable with good quality. In a landmark HF propagation experiment ^[1] <i>Goodman, Ballard and Sharp. A Long-Term Investigation of the HF Communications Channel over Middle and High Latitude Paths. Radio Science Vol32, No. 4 July-August 1997. (Provided in docket #14002, comment #36)</i> the signal-to-noise ratios of all HF frequencies were measured every half hour over twenty-nine northern paths during an eighteen-month period. It was shown that with adaptive frequency selection using at least eight aeronautical bands and with at least four ground stations within reasonable service range, long term availabilities of 0.9999 on a scale of 1.0 were possible for an HF data circuit of the general characteristics described in ARINC 635 and 753. Each of these circuits was measured directly.</p> <p>Making allowances for the additional signal-to-noise ratio required for voice and for the fact that frequency management in a practical HF voice service will have to be based initially on the predicted effects of current solar, interplanetary and geophysical observations modulated by extrapolated current propagation measurements (similar to the spectrum management service we supply ARINC for their HF Data Link Service), we can expect long-term availabilities approaching 0.99.</p> <p>The key to high quality and high availability HF voice is modern, adequate station and spectral assets and near</p>

	Comments
	<p>real time adaptive use of adequate HF spectrum. Both the aircrews and ground stations must know what combinations of frequencies and stations will perform best in light of current, actual radio propagation conditions. Modern, optimized, totally unmanned, all band stations along the lines of the design we suggested for a major service provider can be furnished for around \$300,000, plus installation for perhaps \$200,000. Such stations are now in service.</p> <p>This station design is quite unlike the traditional design. The antenna covers the 2 to 30 MHz spectrum with an elevation plane pattern which is optimized for air-ground service and with a polarization which couples into the lower loss ordinary wave. The transmitters are highly redundant and can transmit on multiple frequencies simultaneously. The receivers feature DSP squelch permitting all frequencies to be guarded all the time. Moreover, we envision all stations in a region sharing the same frequencies in each of the aviation bands. The use of timely radio propagation data along with the use of common frequencies should guarantee contact in three minutes or less ninety percent of the time.</p> <p>With the use of voice over Internet Protocol (I.P.), the formerly formidable back-haul costs can now be de minimus.</p> <p>Good global coverage requires a network of seventeen stations. This and the above considerations lead to the suggestion of one global system operating on regional nets of at least eight common frequencies, with one Global Operations Center.</p> <p>We have reason to believe that most of the existing, struggling HF LDOC service providers would contribute spectral and station assets in return for a share of system revenues. Spectral assets abound. They are simply wasted today. A modern, effective global LDOC service with appropriate spectral and station resources could come together quickly.</p> <p>Emergency communications are both a safety of flight and a security issue. While these needs are clear, their attendant economics are not. The system we outline could be supported on revenues of \$2.1 million per year. Such revenues might come from a small per remote-region flight fee for US carriers and a per contact fee for foreign carriers. Were these revenues to be guaranteed by the Government in return for a rapid and reliable service, such a service would come to pass.</p> <p>The alternative is effectively to force all carriers to use satellite services. The relative economics of such a strategy are not attractive.</p> <p>As of September 10, 2001, there were approximately 9,000 civilian aircraft suitable and equipped for service in oceanic and remote regions. Of these, approximately 2,500 were equipped with satellite equipment. Not all of these had voice capability. Some were equipped for data link only--not considered adequate for emergency communications by many operators. Not all U.S. international scheduled carriers are satellite equipped. The subject NPRM would require only Part 121 operators to reach their dispatch centers within four minutes. Our estimate of the cost for one major US carrier to convert to satellite services is on the order of \$25 million, based on a representative conversion cost of \$300,000 per aircraft. No new aircraft equipage is required to implement our approach.</p> <p>The need for reliable and rapid communications during emergencies is real. Ask any pilot who has dealt with a major emergency over water, at night, without communications services and you are likely to hear a rather passionate argument for responsive communications. The support of the dispatch function is essential in developing a safe diversion plan. Timely support is not irrational; it is vital.</p> <p>With the approach we suggest, the "four-minute" proposal can be met 90% of the time. In order to do so, a modest revenue guarantee or its financial equivalent would be necessary to bring about essential structural changes to the LDOC services.</p> <p>There are those who would argue that it is not the responsibility of the FAA to provide communications assets around the world. We would argue that the FAA has a statutory obligation to promote aviation safety, as well as the economic well-being of the aviation industry. We are advocating an incentive so that private industry will develop and operate the needed communications infrastructure and that, while all oceanic carriers will fly more safely and securely, arguably, more than half the beneficiaries will be U.S. operators. (Radio Propagation—36)</p>
175.	<p>In the NPRM, the Administration has proposed to change a number of its rules, including Rule 121.99(a).***</p> <p>3. On its face, it may appear that these changes are administrative in nature, merely clarifying the existing rule and its interpretation by the FAA. This, however, is not the case. In fact, the amended rule requires the addition of one or two two-way satellite voice radios to the cockpits of UPS' existing fleet (at a cost of millions of dollars) and it imposes an objective 4-minute contact requirement between an airplane and the carrier's dispatch office otherwise known as an airplane operations center ("AOC"). The proposed 4-minute contact rule is a communications requirement that does not now exist except as an unpublished interpretation of an obscure hand-</p>

	Comments
	<p>written memorandum from the legal files of an FAA regional office.</p> <p>4. UPS does not support the proposed amendments to Rule 121.99 because they are unwarranted and lack sufficient evidentiary foundation. As such, the proposed amendments may border on arbitrary and capricious changes to existing regulations. The only empirical data on which the proposed changes appear to be based is a 25-year old memorandum interpreting a version of the instant regulation which, at that time, applied to only domestic U.S. operations. Clearly, the nature of global aviation, and the technologies that support it, have changed significantly since the drafting of the 1977 memorandum. UPS believes that further research and evaluation is necessary before any changes may be made to Rule 121.99.</p> <p>5. Aside from the impracticality of the proposed AOC voice requirements, the addition of a 4-minute contact rule likely presents an impossible regulatory standard. Certain factors make the four-minute contact requirement impractical from an operational point of view. The justification states that there is no cost associated because the aircraft are already equipped with voice radios. Although aircraft are equipped, much of the world lacks the ground infrastructure (radios, telephone line, etc.) to support global connectivity in all areas. Aircraft are equipped with different types of communication radios, appropriate to the region of operations. Typically, two systems of a given type are installed for redundancy. For instance, in an oceanic region, the crew must monitor a high frequency ("HF") ATC frequency. If an aircraft uses HF DL for primary AOC communications, it cannot monitor a third HF voice channel simultaneously.</p> <p>6. For instance, if an aircraft uses HF DL for primary AOC communications, it cannot monitor a third HF long distance operational control ("LDOC") voice channel simultaneously. In most cases, Part 121 carriers are now required to monitor 121.5 MHz (VHF Guard) on the one VHF radio, in addition to ATC on another VHF radio in VHF radio coverage areas. If the rule changes as proposed, a dispatcher will have to contact a flight via data link first, then the crew must switch over to voice and return the call to dispatch. From a transmission time and cockpit workload perspective, a 4-minute requirement for such an action could prove difficult, if not impossible.</p> <p>7. Although limited in its geographic scope, UPS owns and operates one of the world's largest AOC VHF voice networks. Known commercially as the JetComm Network, this system provides AOC voice communications coverage throughout most of North America, as well as limited parts of Europe, Asia, the Pacific and the Caribbean. UPS also uses a number of external communications service providers who offer additional AOC voice communications coverage via HF radio. The decision by UPS and other commercial carriers to provide voice communications capability between the dispatch office and an aircraft on a given route or particular aircraft type is based upon an analysis of the length and geography of the planned routing and the aircrew's ability to operate safely and communicate and navigate effectively along that route. There is no basis for such a decision to be mandated by regulation.</p> <p>8. Options for AOC voice coverage are particularly limited in polar and near-polar regions which typically have the worst HF propagation (due to geomagnetic storms and auroral activity). On the other hand, HF DL networks are specifically designed to compensate for poor polar HF propagation and provide reliability that is not achievable by HF voice systems. Further, WMARSAT (the satellite operator used by all U.S. carriers) does not cover the polar regions. As such, the only high-reliability AOC voice coverage option over polar regions is Iridium. Bottom line--there is not a single U.S. carrier that today could have reliable AOC voice communications in the polar regions under a four-minute standard. Accordingly, the proposed rule change is a mandate for aircraft owners to purchase satellite voice communications equipment.</p> <p>9. While AOC voice communications may provide certain operational benefits to the air carrier, there is no evidence of any safety benefit of voice over data communications when establishing the link between the aircraft and dispatch. The FAA asserts that "reliance on data link communications alone during an emergency could cause an unsafe condition." This assertion is overly broad and unsupported by empirical evidence. UPS might agree with this assertion if it were aimed at the link between the aircraft and air traffic control ("ATC"), but the link between the aircraft and dispatch is less critical during an emergency situation.</p> <p>10. Currently voice communications capability with ATC is required. In an emergency situation, ATC is the primary contact. ATC can provide assistance in the form of revised routes to alternate destinations, separation from nearby aircraft and coordination of emergency equipment and services. None of this assistance can be efficiently provided by the company dispatch office. Airlines establish emergency procedures and crews train in their execution to avoid the necessity of communication and the attendant possibility for error. ATC communication is important in an emergency situation to allocate available resources and mitigate traffic effects. ATC communications are time sensitive because they involve real time control of air traffic. Delays could result in reduced separation between aircraft. ATC communications assure the safe and efficient operation of aircraft within the airspace. Particularly in an emergency situation, AOC communications are given a lower priority than</p>

	Comments
	<p>ATC communications.</p> <p>11. Unfortunately, VHF AOC voice communication service is not available over most of the world or in many areas over which commercial carriers conduct flights. More importantly, in many regions, there is no longer any HF AOC voice service provider. The economic realities of the HF AOC voice service business are driving many service providers to close their doors. By contrast, HFDL coverage is growing. As a result, the only option for voice communications in many locations has become satellite voice communication, and this trend is likely to continue as more HF voice providers cease providing this service. Thus, in order for UPS to continue to conduct flights over many regions, the proposed AOC voice requirement would appear to be, in fact, a satellite voice communications requirement.</p> <p>12. The economic impact of being forced to acquire a satellite voice communications system is immense. Aggravating such an imposition, cargo carriers cannot offset such a capital expense because, unlike their passenger carrier counterparts, there is not a market for an ancillary satellite telephone service on cargo flights.</p> <p>13. The proposed requirement for communications availability “over the entire route” does not provide flexibility but, in fact imposes limits and enormous burdens on an operator. The current wording of Rule 121.99 recognizes that long range communications capability and quality is dependent upon local environmental conditions existing at and between the aircraft and the intended point of communication. Defining specific points along the route allows those conditions to be considered when selecting appropriate radio channels to be monitored. Successful communication requires the calling and called equipment to be selected to the same channel. A strict interpretation of the requirement presently could force the operator to add a satellite voice communications system.</p> <p>14. It must be taken into account that the satellite systems too have limitations. For example, there is no satellite coverage at latitudes greater than about eighty degrees. In these areas, satisfying the requirement for continuous AOC voice communication could be a practical impossibility. Further, although satellite telephone systems have been around for some time, they are complex and cannot meet the four-minute rule 100% of the time. In addition to hardware failures, there are some solar-terrestrial conditions (admittedly somewhat rare) that can cause outages. Additionally, satellite systems have an inherent single point of failure problem, either because of a problem with the satellite itself, or a problem with the operator of the satellite.</p> <p>15. The FAA must consider the attributes of HFDL communications in any analysis preceding a change to the Rule 121.99. In many cases, HFDL communication is faster and easier than voice communications due to the pre-formatted messages. For common occurrences such as diversions the crew might only make a menu selection and type the four-letter destination identifier (e.g. KSDF). At the Data Link User’s Forum held in February of 2003, ARINC reported that 95% of messages were completed in less than 120 seconds. Studies have shown that HF voice communication contacts in remote areas can require four (4) minutes to as much as twenty (20) minutes to accomplish. Practical experience indicates that a four (4) minute requirement will be unrealistic in many remote and over water communication scenarios. In these cases, HFDL communications are decidedly superior to voice communications. (UPS—38)</p>
176.	<p>FAR Section 121.99 has long required air carriers to have “reliable and rapid” two-way communications between their aircraft and dispatch offices “under normal operating conditions” for all domestic operations and flag operations in the 48 conterminous States and the District of Columbia. After March 12, 2001 these requirements were extended to flag operations outside the 48 conterminous States and the District of Columbia. To meet this requirement in the 48 conterminous States, ARINC has established nationwide networks of interconnected VHF voice and data radio stations that enable aircraft to communicate with their dispatch offices and other ground operations for the safety and regularity of flight. ARINC has provided similar capabilities in areas of Hawaiian and Alaskan airspace utilized by commercial air transport aircraft. A number of these stations are staffed by ARINC radio operators, while others are staffed by the individual aircraft operating agencies. ARINC also operates HF stations that provide voice and data communications on over-ocean routes beyond the reach of normal VHF communications.</p> <p>Substantively, the FAA’s proposal would change 14 C.F.R 121.99 in two respects. First, the FAA proposes, for the first time, to define “rapid communications” to mean that the communications between the aircraft and dispatch office must be established within four minutes, whether the call is initiated by the flight crew or the dispatcher. Second, the FAA specifies the requirement for communications under “non-normal and emergency operation conditions,” and, furthermore, the FAA would require that such communications be by voice. ARINC does not believe that either of these changes are necessary.</p> <p>A requirement that 100% of all communications be established within four minutes does not reflect any operational requirements and is unrealistic. The four-minute standard was taken from a 1977 hand-written</p>

	Comments
	<p>“Speed Memo” from the Southern Regional Counsel, responding to an instance involving an air carrier operating in the 48 conterminous States that was staffing the ARINC stations and not using ARINC’s voice or data networks. For this particular air carrier, one-third of the communications took thirteen minutes to establish, and two-thirds took longer than four minutes. Under the circumstances described, it certainly appears that communications were not established in a timely manner, however, there is insufficient operational information presented to support the Speed Memo conclusion establishing the four-minute standard. In most instances when operating in the conterminous 48 States, communications initiated by the flight crew contacting the airline dispatcher can be established in less than four minutes. Many communications initiated by the airline dispatcher contacting the flight crew operating within the 48 conterminous States can also be established within four minutes, especially if the aircraft is equipped with aidground data link communications (either ACARS or VDL Mode 2). However, there will be times when the cockpit workload, radio operator workload, and aircraft equipment use will delay the establishment of a communications path initiated by the airline dispatcher beyond this period. The crew may be busy with other concerns, the radios may be in use communicating with ATC and other airline ground personnel and the like.</p> <p>The March 12,2001 extension of the communications requirements of FAR 121.99 to routes outside of the 48 conterminous States and the District of Columbia emphasizes the need to consider operational requirements when considering the establishment of a time standard for “rapid communications.” For operations within the 48 conterminous States, line-of-sight VHF radio communications can be used to meet the requirements of FAR 121.99. However, communications between aircraft operating in oceanic and remote airspace and their airline dispatch center usually requires the use of HF radio communications. Due to inherent differences in radio transmission characteristics, HF communications are often more difficult to establish and maintain than VHF communications, a fact that is recognized by the FAA and other air navigation service providers (ANSPs) when establishing the operational requirements for ATC communications in oceanic airspace. These operational requirements should be reviewed when considering whether to establish a time standard for “rapid communications.”</p> <p>For five decades ARINC has provided oceanic air traffic control communications services in the New York and Oakland Flight Information Regions (FIRS). The primary means used to provide these communications services is HF voice radio communications. To meet the operational requirements established by the FAA for these communications, ARINC must deliver 95% of ATC clearances within three minutes, 95% of ATC advisories within five minutes, and 90% of ATC requests within five minutes. It is important to note the proposed four-minute time standard for FAR 121.99 communications between aircraft and the airline dispatch office is more demanding than the operationally derived time standards for oceanic ATC communications—a significant inconsistency.</p> <p>Based on our experience as a provider of communications services used to meet the requirements of FAR 121.99, ARINC does not believe that there is an operational justification to define rapid communications more precisely than it is currently defined-especially given the March 200 1 extension of the communications requirements of FAR 121.99 to flag operations outside of the 48 conterminous States.</p> <p>The FAA also proposes to differentiate between communications during “normal operating conditions” and communications during “non-normal and emergency operation conditions.” In both cases, the airline must ensure that two-way communications are available both between the aircraft and the airline dispatch office and between the aircraft and the ATC facility. Voice and data link communications would continue to meet the requirements of FAR 121.99 during normal operating conditions, as is the case today. The use of voice communications during normal operating conditions is well known. Data link communications have proven effective under those same conditions both for communications between the ATC facility (e.g., FANS I CPDLC in oceanic airspace, domestic CPDLC in the Miami FIR) and airline dispatch office (e.g., position reports, equipment and maintenance status and data, and other aircraft data and operational communications).</p> <p>However, in revising FAR 12 1.99 the FAA is proposing that two way voice communication must be available between both the ATC facility and the airline dispatch office during “non normal or emergency operation conditions.” As a provider of aviation safety communications, ARINC clearly recognizes the importance of voice communications during emergency operations and fully endorses the requirement for the airline to maintain two way voice communications with the ATC facility during non normal and emergency operation conditions.</p> <p>Furthermore, ARINC submits that the utilization of data communications for operational control should also be permitted during non-normal and emergency operations. The use of shorthand and pre-defined short communications is actually a more efficient, more expeditious, and more useful form of communication than relying simply upon voice communications. Additionally, data link communications allows the exchange of</p>

	Comments
	<p>information (e.g., engine performance, maintenance reports, weather conditions, and remedial actions) that are difficult or impossible to convey using voice communications. Consequently, when the flight crew is dealing with an emergency, the ability to receive and send data communications, to the aircraft dispatch office will compliment the ability to have voice communications to the ATC facility directly involved in responding to the in-flight emergency. The global, seamless GLOBALink data link communications systems operated by ARINC (i.e., using VHF, HF, and Satellite communications capabilities), provide efficient and extremely reliable communications capability for a wide range of operational situations. As the world's most experienced aviation safety communications service provider, ARINC believes that each airline should be able to develop its own procedures for voice or for data communications and either form of communications should meet the operational control communications requirements of FAR 121.99 during routine, non normal and emergency conditions. RECOMMENDED ACTION: For the foregoing reasons, we recommend that the FAA delete the words "appropriate dispatch office and" from the penultimate sentence of proposed FAR 121.99 and delete the last sentence of the proposed rule altogether. (ARINC Incorporated—39)</p>

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| 177. | <p>§121.99 Communications facilities (a), Item 38, 77344 Comments: The proposed amendments to 121.99(a) contain new requirements relating to communications between aircraft and dispatch, and aircraft and air traffic control. Under normal operating conditions, the operator must show that a two-way communications system is available over the entire route, and that the system will provide reliable and rapid communications between the airplane and the appropriate dispatch office and between the airplane and the appropriate air traffic control unit. Under non-normal and emergency operations conditions, the system for use between the airplane and the appropriate dispatch office and between the airplane and the appropriate ATC Unit must have two-way voice communication capability. In addition, for communications between the airplane and the dispatch office, the caller must be able to establish communications with the called party in less than four minutes ("four minute limit").</p> <p>ATA and its member airlines do not support the proposed four minute limit voice communications between the airplane and the dispatch office because it is unnecessary, it is without any factual justification, and it is arbitrary and capricious. The NPRM provides no factual premises or supporting data of any nature for this new requirement, but refers to a memorandum written more than twenty-five (25) years ago by the Regional Counsel of the FAA's Southern Region. It is our understanding that an interpretation of FAR121.99 was requested to assist the Southern Region in determining if the communications systems between Southern Airways flight crews and dispatch offices in place in 1977 met the intent of the regulation. At that time, this FAR applied only to domestic operations within the 48 contiguous states. In 2001, the requirements were expanded to international operations. To base the instant requirement solely on a "Speed Memo" written decades before implementation of current technologies that ensure reliable communications is simply not reasonable and fails to consider important aspects of today's sophisticated operational and communications networks. Further, it is inconsistent with prior agency practices and actual carrier operations, and fails to consider other, more practical, alternatives.</p> <p>A requirement that the communications system between aircraft and the appropriate dispatch office must be able to establish communication "as soon as practicable" over the entire route is reasonable and will ensure the requisite level of safety. There is no need to mandate an absolute and arbitrary (four minute) requirement that simply cannot be achieved at all times under all circumstances. Most importantly, there is no basis to conclude that in non normal or emergency conditions crew should or must be able to contact the airline dispatch office in less than four minutes. In this type situation, the crew is trained and required by professional skill as well as company policies to focus its full, immediate attention on implementing the safest course of action, communicating with air traffic control and the dispatch office as needed. In some instances, required voice communications in less than four minutes with the dispatch office would be an unwanted and unnecessary distraction for the crew.</p> <p>In addition, for domestic operations, voice communications may be interrupted or delayed due to circumstances outside the operator's control. For example, reliability may be impacted by severe weather, limited frequency availability due to initiation of communications by multiple aircraft or frequency saturation, phase of flight, aircraft location, radio frequency monitoring, and other operating circumstances. For international operations, a four minute limit poses even more difficulties due to the inherent nature of remote/oceanic regions (with intense atmospheric conditions) where the primary communication medium is HF Voice. Today's communications networks are sophisticated, complex, and safe, but due to technological limitations, simply cannot guarantee voice communications between aircraft and the appropriate dispatch office in less than four minutes.</p> <p>For the reasons listed above, ACARS provides a viable, time-proven communications alternative to voice communications systems. Unproven and complex satellite telephone systems would not guarantee voice communications worldwide in less than four minutes 100% of the time under all circumstances, and would be cost prohibitive. Again, it is critical to note that there is no data of any nature that the four minute limit would enhance safety to any degree. Initial cost estimates for satellite communications systems indicate a significant industry wide cost burden. For example, SATCOM would require major aircraft modifications to be completed over a number of years, at a tremendous cost to the operators with no guarantee whatsoever that the four minute limit could be achieved worldwide. Current cost estimates for a nominal satellite communications system from the Honeywell catalog are \$300,000 per aircraft, excluding operational downtime and other required costs for implementation and training.</p> <p>In summary, the four minute limit is not based on any operational threshold and is arbitrary. An absolute time requirement is not necessary and is not achievable. Even implementation of extremely costly satellite systems will not ensure the stringent communications capability between an airplane and the appropriate dispatch office proposed in the NPRM.</p> <p>Resolution: As indicated in our preliminary remarks, if FAA believes further study of communications systems and timely communications is required, TAOARC is the appropriate technical forum for this study. We urge the FAA to utilize this existing group of agency and industry experts before proceeding further. This would ensure a robust, well-informed discussion of current system capabilities, technological developments, and reasonable alternatives to the current proposal, safety concerns, additional issues, potential costs and potential benefits, if any. Significant modifications to existing aircraft communications systems should not be considered or proposed in an NPRM without a full analysis of all criteria. We urge the FAA to withdraw the 1977 memorandum to avoid further confusion on this issue.</p> |
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	Comments
178.	General comment on proposed change to 121.99. This proposed change to require a 4 minute limit to establish communications was obviously written by someone with no operational experience. The proposal is unrealistic. (Vaughn—Continental—37)
179.	§121.99 Communications facilities (a), Item 38, 77344 Comments: The limitation of four-minute voice communications between the airplane and dispatch is arbitrary and unnecessary, especially in light of the fact that it is based on a 25 year old memorandum written regarding communications between Southern Airways flights and their dispatchers. The NPRM should be worded to require communications “as soon as practicable” over the entire route. This 4 minute interpretation fails to address the reality of air operations in that voice communications in remote areas which rely on HF are frequently unreliable or the fact that CPDLC, ACARS, and SATCOM are highly reliable. In US airspace in particular, the use of ACARS for dispatch communications is the preferred tool for many flight crews in lieu of the lengthy process of voice patches, ARINC support, etc. This issue should be addressed by the TAOARC for future recommendations and implementation if appropriate. Utilization of the 1977 FAA memorandum and its initial narrow applicability to a blanket policy for all operators is inappropriate. Full exploitation and implementation for datalink communications (ACARS VHF, HR, or SATCOM) and SATCOM voice equipage should be encouraged by the FAA as opposed to a mandate for voice communications with unrealistic limitations. (AA—42)
180.	The proposed “4-minute” response time stated in this section is arbitrary and is inappropriate for many ordinary circumstances. In the preamble to the FAA, the FAA cites a 26-year-old regional legal opinion as the basis for this time period does not recognize modern operational procedures or technical capabilities. The assumptions made about communication methods, limitations, and capabilities are incorrect – not all Part 121 operators even need have a dispatch function, per se. Further, we maintain that the FAA reconsider requiring “two-way voice communication” as the only permissible communication method, as this unduly restrains use of advancing technologies. (Boeing—43)
181.	Airbus opposes the amendment to Section 121.99 that would define “rapid communications” to mean that the calling party must be able to establish contact with the called party in less than 4 minutes. This proposed regulatory requirement is not realistic, places undue economic burden on operators, and fails to address technical and propagation limitations in communications technology that has been used safely and effectively for many decades. (Airbus—44)
	<u>§121.103</u>
182.	Northwest Airlines is not opposed to the intent of the proposed changes but it appears that all that was done was to change the title of the rule and the body remains focused on establishing requirements for navigation aids, not systems. (NWA—17)
183.	Change the title of the FAR to Enroute Navigation. The use of systems/aids/facilities seems to confuse the rule. (Amer Trans—25)
	<u>§121.121</u>
184.	Northwest Airlines is not opposed to the intent of the proposed changes but it appears that all that was done was to change the title of the rule and the body remains focused on establishing requirements for navigation aids, not systems. (NWA—17)
185.	Delete the proposed change. It appears identical to 121.103. (Amer Trans—25)
	<u>§121.344</u>
186.	Northwest Airlines supports the FAA’s action to create a distinction between Decision Height and Decision Altitude. What is not clear in this rule is what changes, if any will be required to sub paragraph (a)(54) of the rule. If we are required to record only the setting and not a discrete that indicates if it is DH or DA, then we support the change. We would however be opposed if this rule change requires that a discrete be added to the parameters differentiating between DH and DA. (NWA—17)
187.	Change to delete term “control” in air traffic control facilities: (a) No person may operate an airplane under VFR over routes that can be navigated by pilotage unless the airplane is equipped with the communication equipment necessary under normal operating conditions to fulfill the

	Comments
	<p>following:</p> <p>(1) Communicate with at least one appropriate station from any point on the route; and</p> <p>(2) Communicate with appropriate air traffic control facilities from any point within Class B, Class C, or Class D airspace, or within a Class E airspace surface area designated for an airport in which flights are intended. (Boeing)</p>
	§121.349
188.	
189.	Northwest Airlines supports the FAA's efforts to make this rule performance based. We believe it will allow the current navigation infrastructure to evolve into a satellite-based system. And given the direction that the FAA is taking toward an RNP-based infrastructure, making the system performance based will allow the operators to utilize both existing navigation aids and any future satellite-based systems as sensors to navigate using the concept of Required Navigation Performance. We do however believe that the rule as currently written does not provide adequate clarification of what combinations of navigation sensors and/or equipment will satisfy the requirements of the rule and would prefer to see some prescriptive examples in the preamble. (NWA—17)
190.	Section 121.349, "Communication and Navigation Equipment for Operations Under VFR Over Routes Not Navigated by Pilotage or Operations Under IFR or Over the Top". The reference to vulnerability of GPS, which uses very weak signals that are susceptible to interference, should be removed. GPS is much more reliable than any other navigational source. GPS NOTAMs are available and published. Considering that a ground based VOR is a single source transmission but FAA allows dual VOR receivers, it does not make sense to restrict GPS. If the aircraft has "anti jamming devices" it still would not preclude the jamming of the signal coming to the aircraft. If, in fact, the FAA believes jamming is a real threat, then guidance should be clear with respect to the need for one additional independent navigation system when used in conjunction with a GPS. (Delta—18)
191.	<i>"In addition, for non-normal and emergency operating conditions, the FAA proposes to add a requirement for at least one of the independent communication systems to have two-way voice communication capability. The requirement to report DME failures has been removed since it is required in current Sec. 91.187."</i> Refer to our comments with respect to 121.99. (Delta—18)
192.	Section 121.349 Communication and Navigation Equipment...Continues on Page 77335 where the very first sentence again references <i>precision approach and APV</i> . Section 121.349 (Last Sentence) Comment: FAA should be encouraged to adopt performance based language, rather than narrow prescriptive language. (Rackley—24)
193.	Do not change. The seemingly innocent change from receiver to system may eliminate 1,000's of RNAV aircraft having dual DME a/o GPS receivers feeding a single FMS without good cause. What reliability or (MTBF) is FAA seeking? We do not believe that the rule as currently written provides adequate clarification of what combinations of navigation sensors and/or equipment will satisfy the requirements of the rule and has not appropriately considered the economic impact. Delete the reference to precision and NPV and only reference approaches with vertical guidance. Discussion must be placed in the preamble. (Amer Trans 25)
194.	<p>The NPRM directly addresses GPS vulnerability. The proposal clearly states that two navigation systems that rely solely on GPS are not considered independent. This has significant ramifications on equipage, particularly regarding some of the upcoming RNP RNAV equipment configurations. If GPS is a required NAV sensor, does this mean there is no such thing as dual "independent" navigation capability?</p> <p>Comm and Nav equipment IFR--Comment on adoption of performance versus equipment-based rule for requiring specific systems: Performance is the way to go. However, just as with required report to ATC when DME fails above FL240 (revised to FL 180), there must be some method to determine resultant navigation performance. For example, an aircraft equipped with dual FMS and RNP 0.1 capable reports while enroute that one FMS has failed. The air carrier's MEL may state that single FMS operations are limited to RNP 0.3. In this case, it is incumbent on the flight crew to report new RNP limits, rather than equipment status. (RAA--31)</p>
195.	Depending on the intent, these proposed requirements might impact architecture or levels of redundancy in radio equipage in the future. (RAA—31)
196.	The NPRM section-by-section discussion of proposed changes [to 121.349 (a) and 135.165 (a)] states that changes...are intended to address GPS vulnerability. Without jam-proof GPS receivers, the NPRM suggests that two navigation systems relying solely on GPS are not considered independent. On many procedures today, GPS is a required NAV sensor. Additionally, some operators are required to have dual means of navigation. Therefore,

	Comments
	the NPRM language does not support current operating procedures. We recommend the NPRM clearly state how operators using GPS for dual independent navigation capability will comply with all existing regulations. (Rockwell—33)
197.	<p>In response to the FAA’s specific request for comments on one portion of §121.349, we maintain that the FAA should always strive to adopt a broad performance-based rule language rather than a narrow, prescriptive language requiring specific systems. This principle should be applied in general, and not be limited to §121.349, in order to encourage safe and efficient technical advancements without continually having to revise the regulations to accommodate them.</p> <p>The proposed language of §121.349 could be construed to restrict operations with GPS to areas that are within the service volume of the VOR/DME network. This would be an unacceptable and unproductive limitation against implementation of RNAV and RNP. Regarding independence of navigation systems, allowance for flying instrument approaches with a single navigation system should place an obligation on operators to ensure safe operations following failure of that single system. There are no standards for determining which systems are independent and which are not. Two GPS (or other satellite navigation) receivers should be considered independent. (Boeing—43)</p>
198.	<p>Airbus opposes the amendment to Section 121.349 which defines “independent navigation systems” in such a way that restricts, for all practical purposes, GPS equipped aircraft to operations that are within the operational service volume of either VOR, DME, or NDB ground stations. This unnecessary and extremely onerous requirement will eliminate many of the benefits of RNAV and the establishment of a performance based NAS. The preamble makes it very clear that the FAA intent is to restrict operations to the service volume of existing navaids. The preamble states that “the intent of this rule is to ensure that there is no single point of failure or event affecting aircraft navigation systems that causes loss of all ability to navigate along the intended route or to navigate to a suitable diversion airport”. The preamble further states that “For example, two minimum GPS (or other satellite navigation) receivers may not be considered “independent”, since both are so vulnerable to interference.” This statement implies that such interference is very common. However, there is no information that defines the severity and the probability of this potential or any steps the FAA or other government agencies might take in the future to reduce or eliminate the generation of interfering signals. The proposed change would mean that GPS operators would have to show that the aircraft has the capability to comply with Section 121.103 following one of the alleged GPS interference events, which hypothetically could occur at any point along the planned route of flight to the destination or any other airport required for the operation by Part 121.</p> <p>In the case of a GPS equipped aircraft, this means that the operators must be able to show at each point along these routes that the aircraft retains the capability to “navigate the airplane along the route with the required degree of accuracy”. This means that the aircraft can never be outside the operational service volume of the existing navaid network. This is an unreasonable and unnecessary constraint that will significantly impede implementation of a performance based NAS and the achievement of the safety and efficiency benefits of RNAV systems which use GPS information. It will also impose a huge economic burden on many operators. Additionally, there is no know criteria for industry or the FAA to use to determine which GPS systems can be considered “independent” and which are not. Furthermore, there is more than 10 years experience of using GPS systems as the primary means of navigation in oceanic areas. There are no known accident or serious incident in the operations that justify such an onerous requirement in any operation. (Airbus—44)</p>
	§121.351
199.	<i>“In addition, for non-normal and emergency operating conditions, the FAA proposes to add a requirement for at least one of the independent communication systems to have two-way voice communication capability. The requirement to report DME failures has been removed since it is required in current Sec. 91.187.” Refer to our comments with respect to 121.99. (Delta—18)</i>
200.	Proposed §121.351(c)(3), which addresses VHF communication gaps, should be revised to add specific accommodation of SATCOM, broadband, or other specialized communication system gaps, as well as VHF. (Boeing—43)
	§121.579
201.	References to and coordination with FAR §121.579: (NOT IN THIS NPRM) Comment: Additionally, as the

	Comments
	current provisions in FAR 121.579 require revision to enable the future use of RNP, and the current coordination of the NPRM for RNAV and Misc. Amendments will be affected by the current language in 121.579, the ATA requests that FAA consider including revisions to 121.579 as part of the current NPRM activity. Coordination with ongoing efforts to resolve required and necessary revisions to 121.579 are being engaged by the harmonization efforts of the Flight Guidance Harmonization Working Group (FGSHWG). Their recommendations should be adopted and used as a source for additional activities required by revision as part of this NPRM process. (ATA—41)
202.	It is important that the FAA take the opportunity created by issuing this NPRM to revise §121.579 by adopting text provided by the FAA/JAA/Industry Flight Guidance System Harmonization Working Group. The proposed revision to change only the usage of decision height is not sufficient and does not reflect current industry thinking. The detailed proposed text is provided in Enclosure 2. (Boeing—43)
	<u>§121.651</u>
203.	Section 121.651 (last sentence)--“...and any other <i>precision</i> instrument approach system.” Comment: This language is not supported by AC120-29A. (Rackley—24)
204.	(d) “ <i>precision</i> ” approach mentioned twice in this section. This terminology is not supported by AC120-29A. (Rackley—24)
	<u>§121.652 & Appendix M</u>
	<u>PART 125</u>
205.	Parts 125 and 135: Part 121 comments apply to companion language in Parts 125 and 135. (Amer Trans—25)
206.	Reference to further proposed revisions to paragraphs related and applicable to Part 125, Part 129, and Part 135 are not indicated, but corresponding review of these issues should be made to reflect consistent application of policy throughout the regulations. (ATA—41)
	<u>§125.381</u>
207.	Section 125.381 Takeoff and Landing Weather Minimums: IFR--Paragraph mentions “ <i>precision final approach fix</i> ” in Paragraph (c)(1). (Rackley—24)
	<u>PART 129</u>
	<u>§129.17</u>
208.	129.17 Aircraft communication and navigation equipment (a): “...for <i>precision</i> approach and <i>APV</i> operations.” This terminology is not supported by AC120-29A. (Rackley—24)
209.	Reference to further proposed revisions to paragraphs related and applicable to Part 125, Part 129, and Part 135 are not indicated, but corresponding review of these issues should be made to reflect consistent application of policy throughout the regulations. (ATA--41)
	<u>PART 135</u>
210.	Parts 125 and 135: Part 121 comments apply to companion language in Parts 125 and 135. (Amer Trans—25)
211.	Reference to further proposed revisions to paragraphs related and applicable to Part 125, Part 129, and Part 135 are not indicated, but corresponding review of these issues should be made to reflect consistent application of policy throughout the regulations. (ATA—41)
	<u>§135.93</u>
212.	Section 135.93 Autopilot: Minimum Altitude--Proposed Paragraph (b) would mention <i>APV</i> (Rackley—24) 135.93 Contains “ <i>precision approach</i> ” twice in this paragraph. This terminology is not supported by AC120-29A. (Rackley—24)

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	<u>§135.165</u>
213.	Makes reference to “ <i>precision approach and APV</i> operations”. This terminology is not supported by AC120-29A. (Rackley—24)
214.	[See Rockwell (#33) comment on §121.349 (a) above.]
	<u>§135.225</u>
215.	In re (c)(1) Want to include terms “ <i>precision or APV approaches</i> ”--This language is not supported by AC120-29A. (Rackley—24)
216.	In re (c)(3) Change wording to “on a <i>nonprecision</i> final approach.”--This language is not supported by AC120-29A (Rackley—24)